

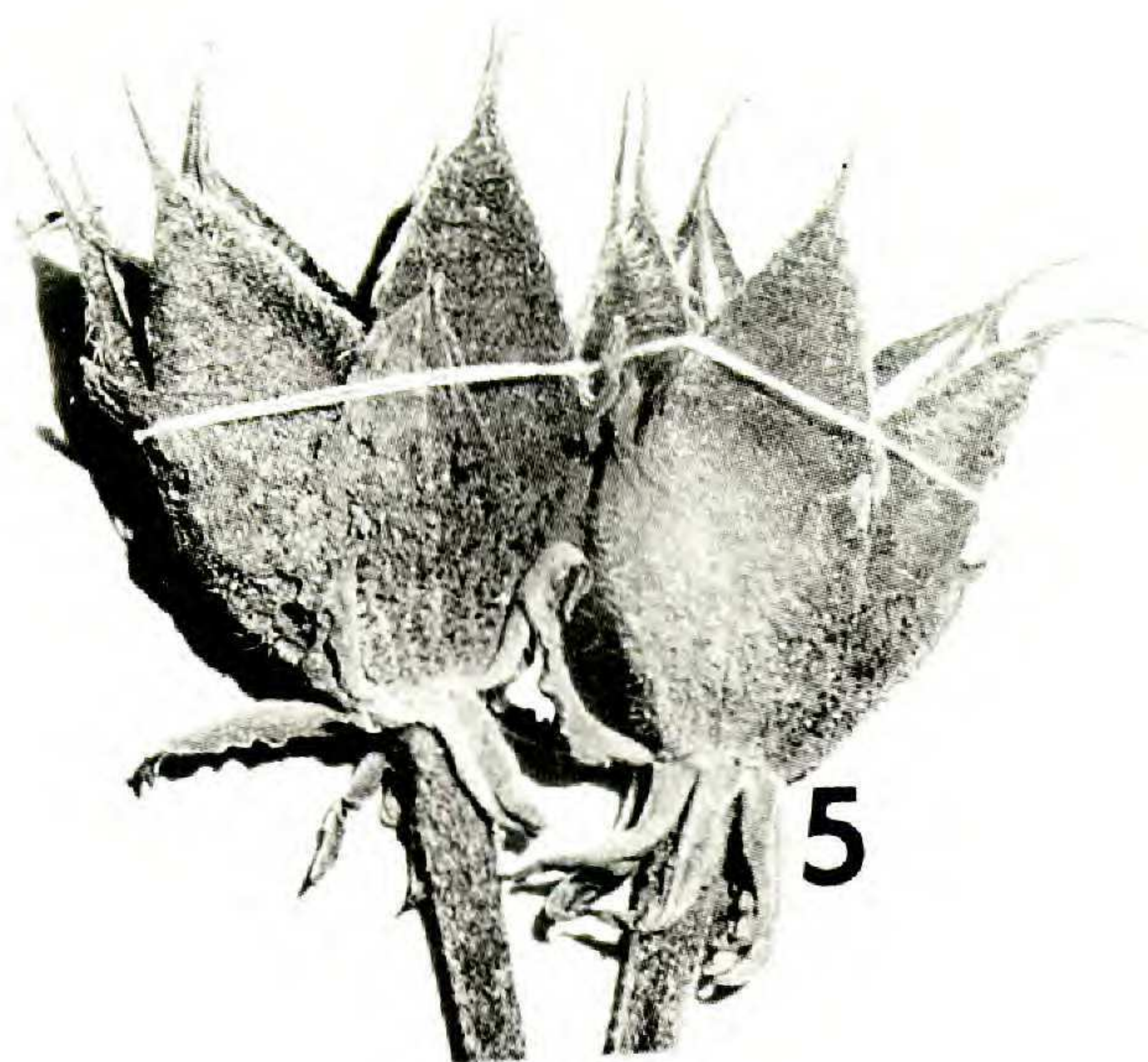
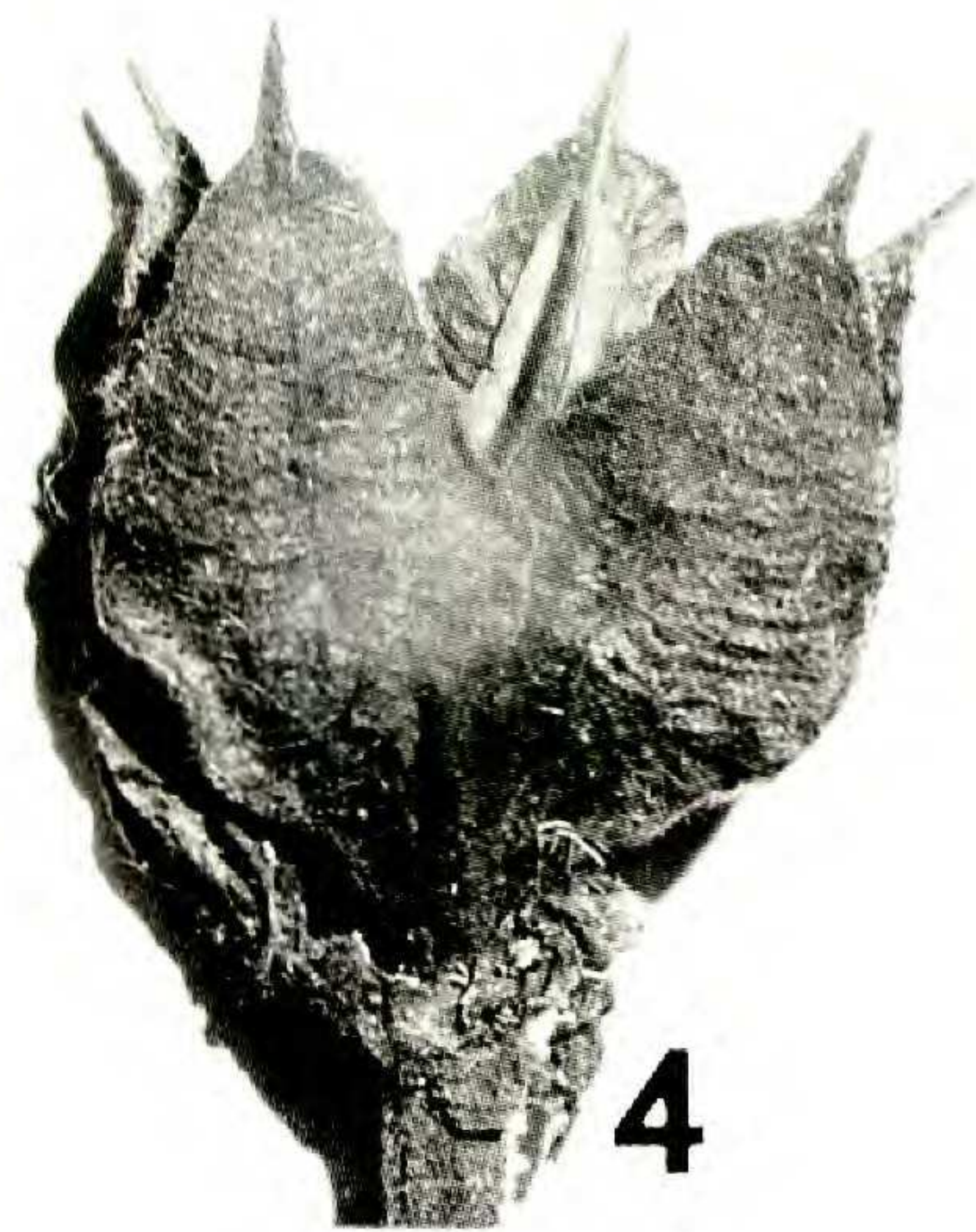
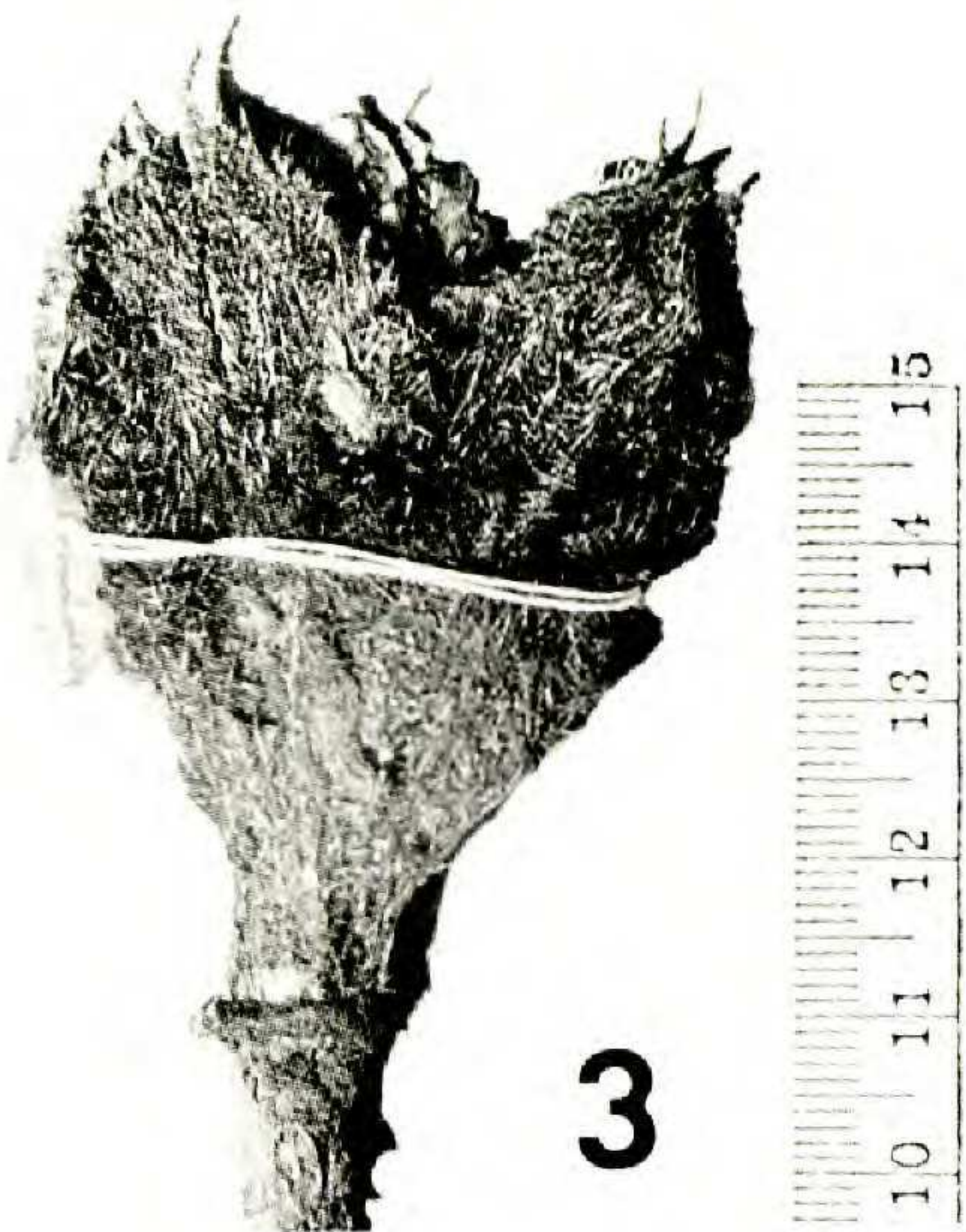
REVISION AND EXPANSION OF THE NEOTROPICAL GENUS  
WERCKLEA (MALVACEAE)

PAUL A. FRYXELL

PITTIER AND STANDLEY (Standley, 1916) described the genus *Wercklea* to include a single Costa Rican species, *W. insignis*. In 1921 Rolfe added a second species, *W. lutea*, also from Costa Rica. Subsequently, *Wercklea* has been considered to be endemic to Costa Rica and to include only these two species, although it was tentatively increased to "about 2-4 species" in *Hortus Third* (Bailey Hortorium Staff, 1976). The genus has been maintained as distinct by Standley (1937), Kearney (1951), Hutchinson (1967), and Bailey Hortorium Staff (1976); Robyns (1965, 1966), however, has merged *Wercklea* in *Hibiscus* L. and has transferred the two Costa Rican species to the latter genus.

Fries (1947) recognized a "species group" that included his newly described *Hibiscus trichomathus* R. E. Fries, together with *H. hottensis* Helwig ex Urban, *H. horridus* Urban, *H. ferox* Hooker, *H. ferox* var. *metensis* Triana & Planchon, and *H. pseudoferox* Hochr.—that is to say, those species with glabrous fruits, more or less armed (prickly) herbage, and sometimes inflated calyces. He referred this group to *Hibiscus* sect. *FURCARIA*, following Hochreutiner (1900), but such a placement is manifestly incorrect. Moreover, it is now apparent not only that the occurrence of these distinctive prickles and the inflation of the calyces are variable within this group, but also that the presence of the prickles extends beyond the group to other similar species that lack inflated calyces and have hispid rather than glabrous fruits (*Hibiscus woodsonii* A. Robyns and *Wercklea lutea*). Thus, whether one begins with Pittier and Standley's genus *Wercklea* or with Fries's "species group" in *Hibiscus*, one converges on a larger combined group that exhibits considerable cohesiveness, both morphologically and geographically, as well as distinctness from other plants. My own observations support the opinion that *Wercklea*, as here expanded to 12 species, is generically distinct from *Hibiscus*.

Several characters other than those emphasized by Pittier and Standley support this distinctiveness. These include the often arborescent growth habit, which is found in *Hibiscus* only in the very dissimilar sect. *AZANZAE* DC.; the very large, long-petiolate, more or less orbicular leaves that lack foliar nectaries; the distinctive vestiture (to be discussed separately in the following paragraph); the very large and prominent stipules, of a size and conformation not otherwise found in *Hibiscus*; and the distinctive fruits, which are obovate or fusiform and often prominently beaked and winged (FIGURES 1-6). Pittier and Standley described *Wercklea* as being distinctive in having amphitropous



ovules, but observations are not available to confirm the value of this character in delimiting the genus.

The vestiture of *Wercklea* is distinctive, and the following classes of hairs may be enumerated (cf. Payne, 1978): 1) stellate hairs, common throughout the family, found in all species of *Wercklea* and on nearly all plant parts, except where the plant may be glabrate (especially in *W. insignis*); 2) bristles, generally simple, often pungent; 3) pungent hairs or prickles, with a small, swollen basal cushion, usually simple but sometimes bifurcate or stellate; 4) pungent hairs or prickles with a large, yellowish, swollen column at the base and a spinescent tip; and 5) stout, conical prickles, themselves often stellate-pubescent, sometimes curved, usually ligneous and yellowish, with a spinescent tip. The stellate hairs are found more or less throughout the plant in most of the species and constitute a background of vestiture upon which the other kinds of hairs are superimposed. These more specialized hairs are distributed differentially on various plant organs, depending upon the species (see TABLE 1). In species with prickly leaves, the distribution of the prickles is noteworthy: on the lower leaf surface the prickles are found on the main veins, whereas on the upper surface they occur on the lamina between the veins (FIGURES 9, 10). This pattern of distribution seems not to have been noted before, although it is distinctive of the genus as here circumscribed and appears to be unique to it.

A number of characters suggest a stronger affinity of *Wercklea* with *Abelmoschus* Medikus than with *Hibiscus*. These common characters include the frequent occurrence of pungent hairs, the relatively large leaves lacking foliar nectaries, the long-beaked fruits that are often winged (*Wercklea*) or angled (*Abelmoschus*), and other, more subtle similarities involving the form of the involucl and calyx. *Wercklea* might be regarded as a neotropical analogue of the paleotropical *Abelmoschus*. Other characters, including chromosome number, may provide a basis for evaluating this suggested relationship. Bates (pers. comm.) has found *W. ferox* to be a high polyploid, with  $n = 52$  or  $56$  ( $2n = 104$  or  $112$ ), the only chromosome number yet known for *Wercklea*. Reported chromosome numbers for *Abelmoschus* are: *A. esculentus* (L.) Moench,  $2n =$  ca. 66, 72, 118, 120, 122, 130, 132; *A. ficulneus* (L.) Wight & Arnott,  $2n = 72, 78$ ; *A. manihot* (L.) Medikus,  $2n = 60, 66, 68, 130$ ; and *A. tuberculatus* Pal & Singh,  $2n = 58$ . Such variability makes it difficult to propose base numbers for these genera. The affinity of *Wercklea* and *Abelmoschus* is further suggested by the vernacular name for *W. tulipiflora* (Hooker) Fryxell ("gambo montagne" or wild okra) and by Walpers's transfer of this species to the genus *Abelmoschus*.

Several vernacular names have been recorded for species of *Wercklea*. "Pringamoza" (= nettle) has been used for both *W. ferox* (López & Sánchez

---

FIGURES 1-6. *Wercklea* fruits: 1, *W. ferox* (Williams 819), inflated calyx removed; 2, *W. tulipiflora* (Duss 2323; see FIGURE 24); 3, *W. lutea* (Standley 38645); 4, *W. woodsonii* (D'Arcy 5368); 5, *W. woodsonii* (Nee 9999; see FIGURE 28); 6, *W. insignis* (Rowlee & Stork 286; see FIGURE 20).

TABLE 1. Distribution of specialized vestiture in *Wercklea* (excluding the nearly ubiquitous stellate hairs).\*

SPECIES	STEMS	LEAVES	PEDICELS	INVOLUCELS	CALYCES	FRUITS
<i>ferox</i>	5	5	4	3	4	—
<i>pseudoferox</i>	5	5	4	3	4	—
<i>magnibracteata</i>	3	—	2	2	2	—
<i>horrida</i>	4	4	4	4	4	—
<i>hottensis</i>	4	4	4	4	4	—
<i>flavovirens</i>	—†	—†	—	—	—	—
<i>lutea</i>	5	5	3	—	3	2
<i>woodsonii</i>	5	—	—	—	3	2
<i>cocleana</i>	—	—	—	—	3	2
<i>grandiflora</i>	—	—	—	—	—	2?
<i>insignis</i>	—	—	—	—	—	2
<i>tulipiflora</i>	—	—	—	—	—	—

\*The kinds of specialized hairs are identified by number in the text, p. 459.

†The stems and leaves of juvenile *W. flavovirens* are densely spinescent (4), but the mature plants are unarmed.

24) and *W. horrida* (Howard & Howard 8543), in obvious reference to the prickly character of these species. “Gambo montagne” (Beard 235), “gambo marron” (Cooper 40), and “gambo grand bois” (= wild okra) (Duss 2323), all used for *W. tulipiflora*, indicate a resemblance of this species to *Abelmoschus*. *Wercklia woodsonii* (A. Robyns) Fryxell (White 41) has been called “amapola amarilla” (= yellow poppy), descriptive of its flower. “Burío extranjero” (= foreign “burío”) has been used for *W. lutea* (Standley & Valerio 44025), and “burío” (Lankester & Jiménez 1348) for *W. insignis*; both names refer to use as a source of bast fibers in making rope. The name “burío” is applied to several other species in the Malvales (*Apeiba tibourbou* Aublet, *Hampea appendiculata* (Donn. Sm.) Standley, *Heliocarpus* spp.) that have the same use (Fryxell, 1969). Such use may be general for the genus, at least for the larger (arborescent) representatives; it has been noted for *W. woodsonii* (White 41) and *W. tulipiflora* (Hodge 1127), in addition to *W. lutea* as noted above. The sap of *W. lutea* is described as mucilaginous (Burger & Liesner 6412), which also may be general for the genus, inasmuch as it is a character common in the family Malvaceae.

The flowers of *Wercklea ferox* (Gentry 8801) and *W. grandiflora* (Nee 9842) are described as odorless. They are “very fragrant” in *W. woodsonii* (White 175), and the floral odor is “slightly sweet” in *W. lutea* (Webster et al. 12383).

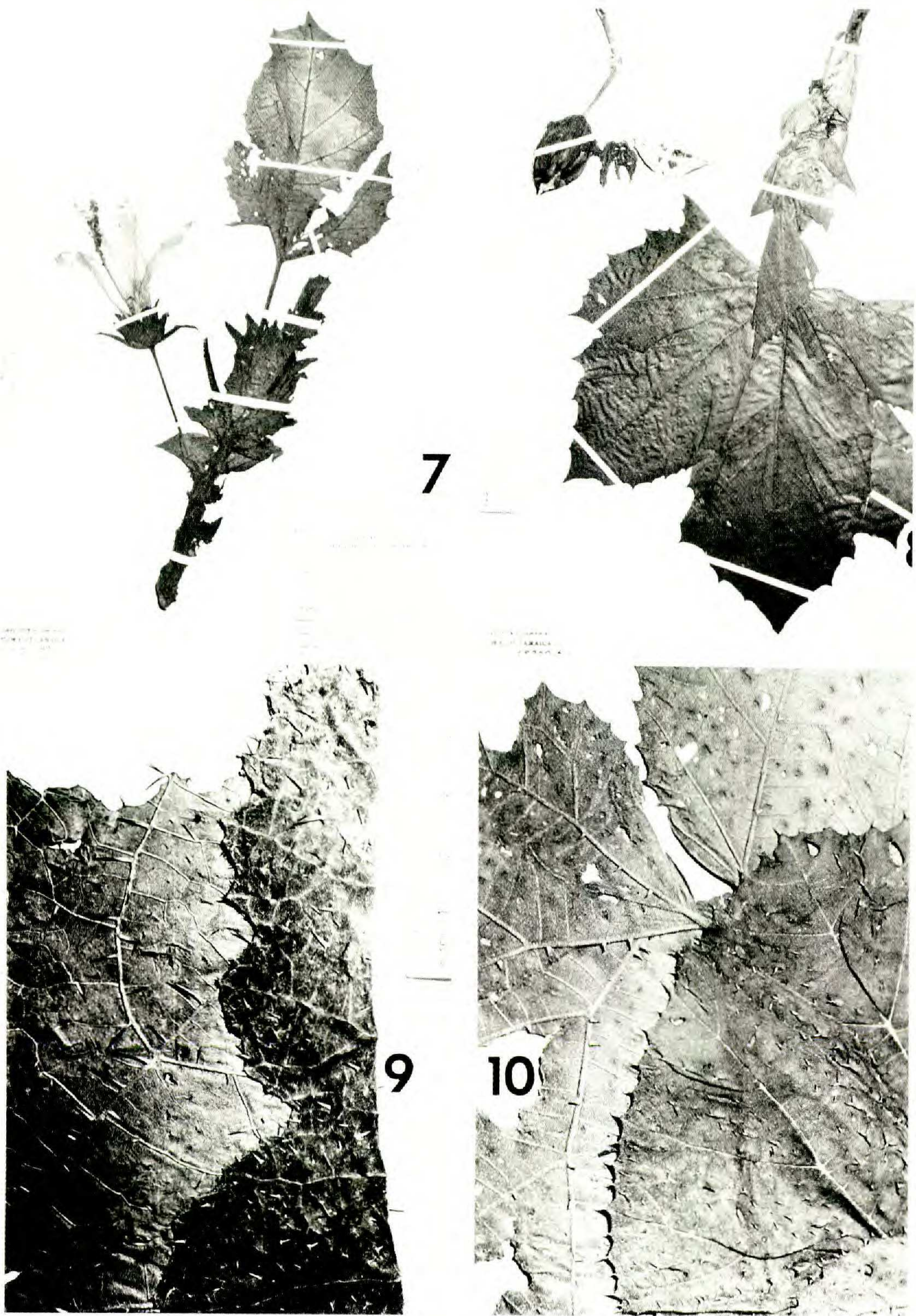
Webber (1934, quoting Hyde, 1925) described *Wercklea insignis* as having exceptionally light wood—15 lbs. per cubic foot (or a specific gravity of 0.24), comparable to that of cork.

**Wercklea** Pittier & Standley in Standley, Contr. U. S. Natl. Herb. **18**: 112. 1916. TYPE SPECIES: *Wercklea insignis* Pittier & Standley.

Coarse herbs, shrubs, or trees, usually 2–20 meters tall, stellate-pubescent to glabrate; stems with prominent leaf and stipule scars, sometimes with ligneous prickles on stems and spinescent prickles or pungent hairs elsewhere. Leaf blades often too large to be adequately represented on herbarium sheets (i.e., only younger leaves preserved), deeply cordate, wider than long, more or less orbicular or sometimes ovate, occasionally weakly pentagonal or 5- to 7-lobed, sharply and remotely dentate (teeth sometimes spinescent) to subentire, obtuse to acute, palmately several nerved, stellate-pubescent (especially on veins) to glabrate above and beneath, the hairs of upper surface often fewer, smaller, and with tendency toward antrorse orientation, prickles also sometimes present between veins on upper surface and on veins on lower surface; foliar nectaries absent. Petioles shorter than to longer than leaf blade, usually with pubescence like that of stem. Stipules large and prominent (FIGURES 8, 13), 1–2 times as long as broad, 5–80 mm. long, 5–45 mm. broad, sessile and amplexicaul, lanceolate to broadly ovate to semicircular, entire (rarely bifid), acute to obtuse, stellate-pubescent, caducous, leaving scars to 1.5 cm. long. Pedicels erect, one to several in leaf axils, articulate at (or near) base and thus often appearing inarticulate, shorter than subtending petiole to greatly exceeding it, sometimes accrescent in fruit, reaching 20–34 cm. or more in some species, stellate-pubescent to glabrate, sometimes also with pungent hairs or spinescent prickles, often becoming stout and ligneous in fruit. Involucel gamophyllous or of distinct bracts (or intermediate), usually shorter than calyx, deciduous or persistent, stellate-pubescent to glabrate, pungent hairs (if present) fewer than on calyx or pedicel; bracts (if distinct) 3 to 10, lanceolate, ovate, or subrhomboid. Calyx gamosepalous, deeply 5-parted or spathaceous and apically 5-toothed, stellate-pubescent and sometimes also prickly, sometimes accrescent and inflated in fruit (FIGURE 14). Corolla greenish yellow, bright yellow, orange, or rose, 6–15 cm. long, more or less stellate-pubescent (in part or throughout; stellate hairs rarely absent), campanulate or salverform. Staminal column shorter than to subequal to corolla, appearing exerted in species with salverform corollas, glabrous or stellate-pubescent, staminiferous throughout or only distally. Styles slightly exceeding androecium, connate nearly throughout (distinct only for distal few millimeters); stigmas 5, large and capitate, crowded. Fruit capsular (FIGURES 1–6), 5-loculed, oblong, obovate, or fusiform, prominently winged or unwinged, densely hispid, stellate-pubescent, or glabrous, often with prominent beak, relatively woody, dehiscent but not opening widely, internally pubescent or glabrous. Seeds about 20 per locule, reniform or phaseoloid, blackish, 2.5–4 mm. long, densely long-pubescent, short-puberulent, or glabrous.

All species appear to occur in relatively wet habitats, whether on river banks or in rain or cloud forests. Different species have different altitudinal preferences, but several of them occur at elevations relatively high for the Malvaceae (to 2700 meters for *Wercklea lutea* and *W. woodsonii*). The relatively widespread *W. ferox* occurs as low as sea level.

Many species of *Wercklea* have one or more characters that are unique or essentially so within the genus; the species can be identified on the basis of any one. Outstanding in this respect is *W. tulipiflora*, which has a



FIGURES 7-10: 7, *Wercklea flavovirens* (Watts et al. 1548), in flower; 8, *W. flavovirens* (Proctor 37837), in fruit; 9, *W. horrida* (Ekman 14115), leaf folded over to show differing spine pattern on upper and lower surfaces; 10, *W. ferox* (Allen 4098), leaf folded over to show differing spine pattern on upper and lower surfaces.

constellation of at least six such traits. Other species have no truly unique characters but may be identified on the basis of combinations thereof. These distinctive characters or character combinations are noted for each species following its description; they are, of course, also used in the construction of the key.

Standley (1937, p. 677) dedicated the genus “. . . to Carlos Wercklé, genial, tireless, and enthusiastic explorer of the Costa Rican forests, a well informed student of the flora of his adopted land.”

#### KEY TO THE SPECIES OF WERCKLEA

- A. Fruits externally glabrous, sometimes enclosed by calyx; pedicels and calyx often densely beset with spinescent prickles; stems and leaves often prickly; calyx ca.  $\frac{1}{4}$ - to  $\frac{1}{3}$ -divided.
- B. Calyx at anthesis 2.5–6 cm. long, accrescent to 9(–13) cm. long and inflated in fruit, prominently 10-fluted; capsule internally glabrous, enclosed in spathaceous calyx. Central and South America.
- C. Pedicels usually fasciculate, shorter than subtending petiole, 2–10 cm. long at anthesis to 13 cm. long in fruit; corolla 6–9 cm. long. Costa Rica to Bolivia, usually below 1000 m. alt. . . . 1. *W. ferox*.
- C. Pedicels solitary or paired, exceeding subtending petiole, 20 cm. long at anthesis to 34 cm. long in fruit; corolla 10 cm. long or more. Colombia.
- D. Bracts of involucl 8 or 9, 20–25 mm. long, 4–6 mm. wide; leaf margins serrate, teeth spinescent. . . . 2. *W. pseudoferox*.
- D. Bracts of involucl 3 to 6, 40–45 mm. long, 16–27 mm. wide; leaf margins serrate, without spines. . . . 3. *W. magnibracteata*.
- B. Calyx at anthesis 2–3 cm. long, somewhat accrescent but neither inflated nor exceeding fruit; capsule internally pubescent, equaling or exceeding calyx. Hispaniola and Jamaica.
- E. Pedicels 11–28 cm. long, longer than subtending petiole; leaves obscurely lobed; involucl more or less gamophyllous; fruits 5 cm. long. Haiti. . . . . 5. *W. hottensis*.
- E. Pedicels up to 9 cm. long, shorter than subtending petiole; leaves manifestly lobed; involucellar bracts distinct; fruits 2–4.5 cm. long.
- F. Bracts of involucl ca. 10, lanceolate, 10–18 mm. long, less than 6 mm. wide; petals rose, pubescent internally and externally; fruits 2–3 cm. long; plant spinescent at maturity. Dominican Republic. . . . . 4. *W. horrida*.
- F. Bracts of involucl ca. 6, ovate, 25–30 mm. long, up to 12 mm. wide; petals greenish yellow, glabrous internally, pubescent externally; fruits 4.5 cm. long; plant spinescent in juvenile stage, unarmed at maturity. Jamaica. . . . . 6. *W. flavovirens*.
- A. Fruits externally stellate-pubescent or hispid, equaling or exceeding calyx; pedicels and calyx stellate-pubescent to glabrate, sometimes with few pungent hairs at apex of pedicel and base of calyx; stems and leaves lacking prickles (or few present in *W. lutea* and *W. woodsonii*); calyx usually ca.  $\frac{1}{2}$ -divided (or more in *W. tulipiflora*).
- G. Fruits stellate-pubescent, hairs less than 0.5 mm. long; leaves markedly discolorous; calyx more than  $\frac{1}{2}$ -divided; petals 7–10 cm. long, externally with dense, stellate pubescence throughout; stamens arising more

- or less throughout length of staminal column. Lesser Antilles, 600–900 m. alt. . . . . 7. *W. tulipiflora*.
- G. Fruits densely hispid with pungent hairs 2–4 mm. long; leaves somewhat discoloured to nearly concolorous; calyx about 1/2-divided; petals 8–13 cm. long, externally stellate-pubescent but usually glabrate toward base; stamens arising only in apical 2–3 cm. of staminal column. Costa Rica and Panama.
- H. Involucel 5 cm. long, gamophyllous and spathaceous, deciduous; petals 13 cm. long, more or less orange. Veraguas, Panama, ca. 900 m. alt. . . . . 8. *W. grandiflora*.
- H. Involucel 1.5–4.5 cm. long, more or less gamophyllous or 8- to 10-parted, persistent or deciduous; petals 7.5–13 cm. long, yellow or rose-lavender. Costa Rica and Panama.
- I. Petals yellow; bracts of involucel more or less distinct (sometimes irregularly or basally connate); calyx stellate-pubescent and with a few pungent hairs toward base; capsules more or less pubescent internally along suture margin. 1500–2700 m. alt.
- J. Involucel basally rounded, deciduous, the bracts 3, broadly ovate-sessile. Costa Rica, 1500–2500 m. alt. . . . 9. *W. lutea*.
- J. Involucel basally truncate, persistent, the bracts 8 or 9, narrowly triangular, with margins revolute basally. Costa Rica and Chiriquí, Panama, 1800–2700 m. alt. 10. *W. woodsonii*.
- I. Petals rose-lavender; bracts of involucel more or less gamophyllous, irregularly lobed or divided; calyx stellate-pubescent, with or without pungent hairs toward base; capsules glabrous internally. 700–1700 m. alt.
- K. Pedicels 1–10 cm. long at anthesis to 20 cm. long in fruit, sparsely pubescent to glabrate; leaf blades glabrate above, obscurely dentate to subentire; calyx minutely and very sparsely stellate-pubescent; staminal column 3–4 cm. long, subglabrous; fruits densely hispid, hairs 3–4 mm. long. Costa Rica, 750–1700 m. alt. . . . . 11. *W. insignis*.
- K. Pedicels 13–26 cm. long at anthesis to 30 cm. long in fruit, densely stellate-pubescent; leaf blades sparsely stellate-pubescent above, densely so on nerves, dentate; calyx minutely stellate-pubescent and with pungent hairs 1–2 mm. long toward base; staminal column 9–10 cm. long, stellate-pubescent at least basally; fruits densely hispid, hairs 2 mm. long. Coclé, Panama, 700–900 m. alt. . . . . 12. *W. cocleana*.

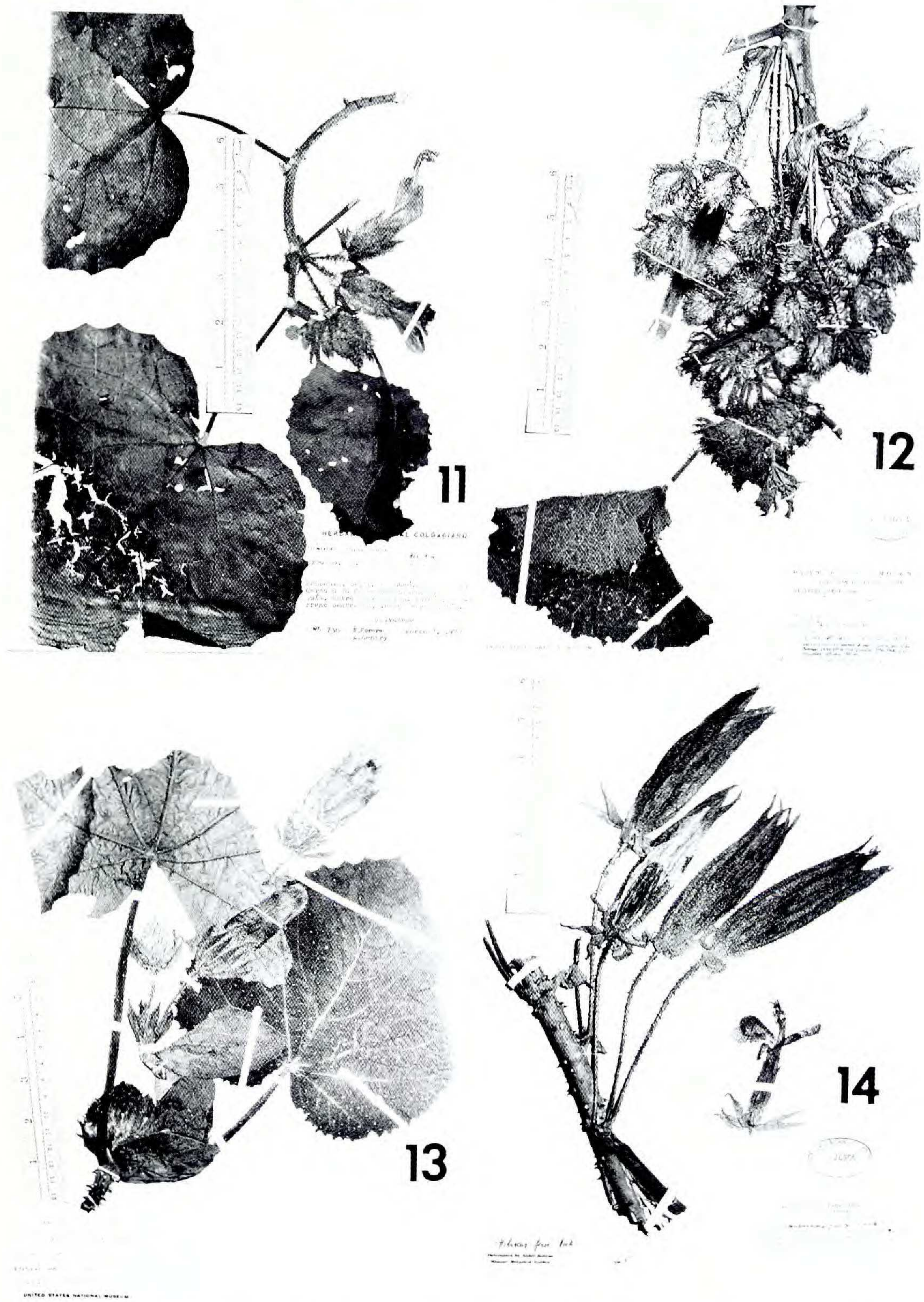
1. **Wercklea ferox** (Hooker) Fryxell, comb. nov. FIGURES 1, 10–14.

*Hibiscus ferox* Hooker, Bot. Mag. 74: t. 4401. 1848. TYPE: Colombia, prope Iratcho, Dec. 1825, Purdie s.n. (holotype, κ). Note: a mirror-image reprint of t. 4401 occurs in Fl. Serres 4: t. 400. [Oct.] 1848.

*Hibiscus ferox* var. *metensis* Triana & Planchon, Prodr. Fl. Novogranat. 166. 1862. TYPE: Colombia, Meta, Llano de San Martín Villavicencio, alt. 500 ft. [ca. 150 m.], Jan. 1856, Triana & Planchon 5277 (BM; photo, NY).

*Hibiscus trichomathus* R. E. Fries, Kongl. Svenska Vetenskapsakad. Handl. III. 24(2): 31. t. 9. 1947. TYPE: Ecuador, Prov. Napo-Pastaza, Cosanga, alt. 1900 m., 11 Jan. 1940, Asplund 10327 (holotype, s; isotypes, s, US).





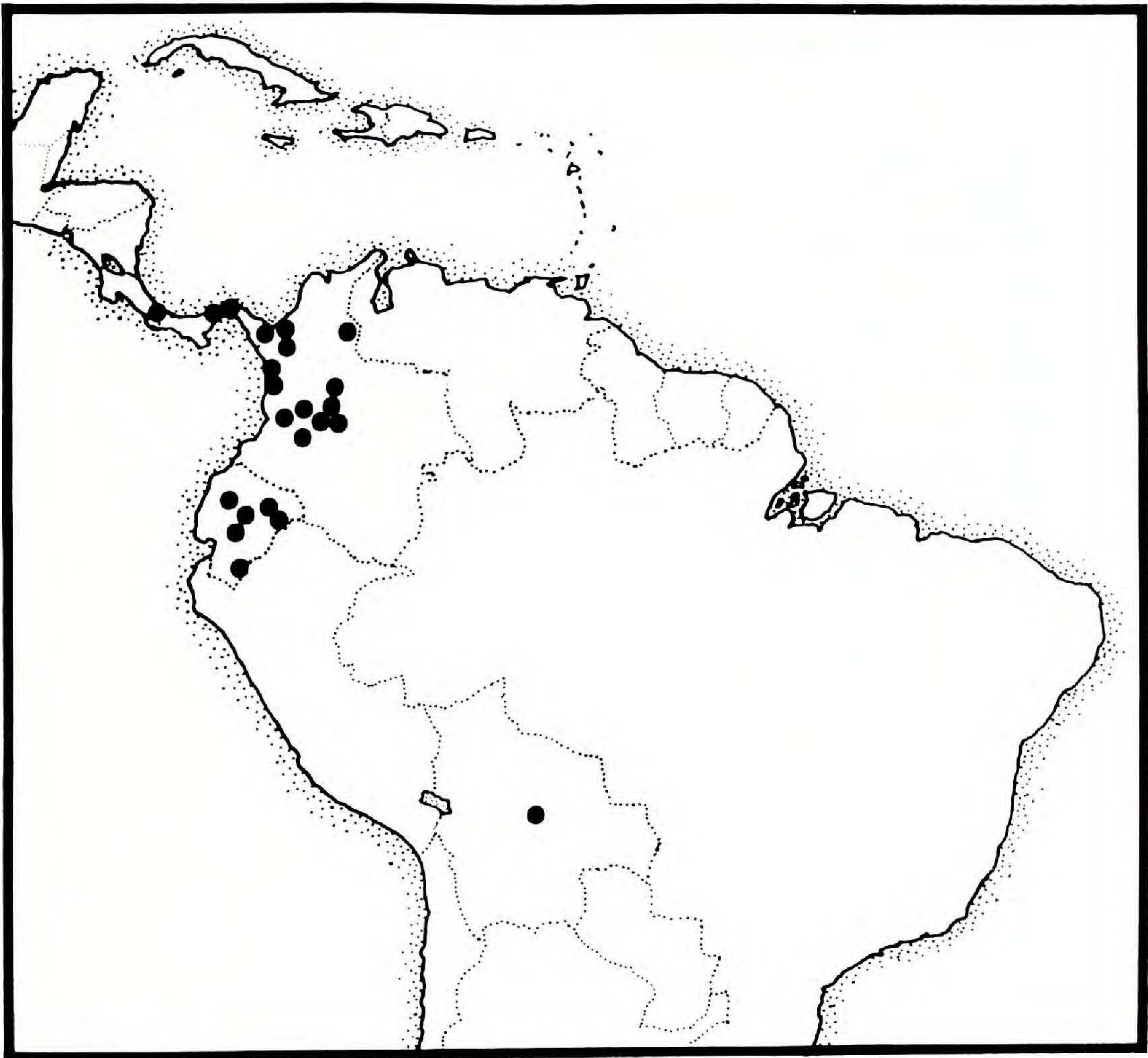
FIGURES 11-14. *Wercklea ferox*: 11, *Forero & Gentry 736*, spines absent on leaves; 12, *López & Sánchez 24*, extreme example of fasciculate flowers; 13, *Haight 5465*, showing large stipules characteristic of *Wercklea*; 14, *Steyermark & Allen 17223*, showing accrescent calyces and (in one case) enclosed fruit (cf. FIGURE 1).

Stout herb, shrub, or tree 0.5–5 meters tall; stems minutely to coarsely stellate-pubescent and also more or less aculeate, the prickles yellowish, ligneous, conical, 4–8 mm. long, 4–6 mm. broad at base. Leaf blades to at least 35 cm. long, 50 cm. broad, cordate, ovate or flabelliform to weakly lobulate, serrate (teeth often remote, sometimes spinescent), more or less acute, palmately 7- to 9-nerved, the upper surface stellate-pubescent (hairs often few armed, sometimes simple) or glabrate, with yellowish, spine-tipped prickles 2–5 mm. long on lamina between veins, the lower surface more densely and coarsely stellate-pubescent, with prickles located on principal nerves, prickles above and below sometimes sparse to absent. Petioles to 45 cm. long, stellate-pubescent and prickly like lamina, prickles sometimes few or absent. Stipules 3–5(–8) cm. long, 0.8–2.5(–4.5) cm. wide, sessile-ovate (rarely bifid), acute, minutely stellate-pubescent and with few simple hairs 1–2 mm. long especially on margins, deciduous leaving prominent scars. Pedicels in fascicles of 1 to 5 (to 9) in leaf axils, shorter than subtending petiole, 2–10 cm. long at anthesis to 13 cm. long in fruit, densely covered (especially apically) with spreading or retrorse prickles or pungent hairs 3–8 mm. long (these usually with enlarged bases) and with stellate hairs. Involucellar bracts 6 to 10, distinct (rarely gamophyllous: *von Sneidern 5422*, *Kalbreyer 1303*), 1.5–3(–5) cm. long, 4–12 mm. wide, lanceolate, acute, minutely pubescent and with some pungent hairs. Calyx 2.5–3.5(–5.5) cm. long at anthesis to 8(–13) cm. long in fruit, gamosepalous and spathaceous becoming inflated (fusiform) and reticulate veined, 10-fluted, externally densely beset with spinose-tipped pungent hairs 3–4(–10) mm. long (these usually with enlarged bases), internally glabrous, 5-lobed; lobes 6–9(–20) mm. long, triangular. Petals 6–9 cm. long, .5–1.5 cm. wide, yellow, externally densely covered with minute, peglike hairs and with at least few stellate hairs distally, reflexed to form salverform corolla (rarely (*Haught 5465*) corolla 10 cm. long, campanulate). Staminal column glabrous, shorter than to equaling petals but often appearing exerted when petals reflex, staminiferous in distal 1.5 cm. Styles slightly exceeding androecium, barely divided, with 5 capitate, purplish, hairy stigmas. Fruit 3–5 cm. long, 1–2 cm. in diameter, a cylindrical or oblong capsule, essentially wingless, wholly enclosed by inflated calyx, glabrous internally and externally, beak reduced to 0.5–2 mm. long. Seeds numerous, 2.5–3 mm. long, phaseoloid, blackish, minutely puberulent, hairs less than 0.1 mm. long.

DISTRIBUTION. Costa Rica to Bolivia (MAP 1), sea level to 1000(–2000) m. alt.

ADDITIONAL SPECIMENS EXAMINED. **Costa Rica.** TALAMANCA: bords du Buridikur, *Pittier 9404* (US). **Panama.** PANAMÁ: tributary of Río Chagres, 5 mi. [8 km.] SW. of Cerro Brewster, *Lewis et al. 3431* (COL, MO, UC). CANAL ZONE: forest between Peluca Hydrographic Station and Quebrada Peluca, along Río Boquerón, *Steyermark & Allen 17223* (BR, CAS, K, MO, S, UC); gravel bench of Chagres at Alajuela, *Pittier 2345* (BM, US). COLÓN: vic. of Portobelo, *Croat 33571* (MO, pf<sup>1</sup>); along river ca. 4 mi. [6.5 km.] SW. of Portobelo, *Croat*

<sup>1</sup>The acronym “pf” refers to the author’s herbarium.



MAP 1. Distribution of *Wercklea ferox*.

14108 (MO); 10 mi. [16 km.] SW. of Portobelo, 2–4 mi. [3.2–6.5 km.] from coast, *Liesner 1102* (F, MO, NY); Río Viejo, vic. of Puerto Pilón, *Allen 4098* (MO, NY, s); mouth of Río Piedras, beach and adjacent area, *Lewis et al. 3164* (COL, DUKE, K, MO, UC); Río Guanache, between María Chiquita and Portobelo, 1–5 mi. [1.6–8 km.] up river from hwy., *Foster & Vocelka 2192* (DUKE, MO); Río Guanache, 1–4 km. upstream from Portobelo Rd., *A. Gentry 8801* (F, MO, pf); Río Guanache, *D'Arcy 9726* (MO, pf); Caña and vic., *Williams 819* (CAS, NY, US). DARIEN: Mannene to mouth of Río Coasí, *Kirkbride & Bristan 1421* (NY). **Colombia.** NORTE DE SANTANDER: región del Sararé, Hoya del Río Cubugón, El Indio, *Cuatrecasas 13093* (F, US (3 sheets)). ANTIOQUÍA: Chigorodó, carretera a Turbo, *García-Barriga 17653* (NY, US); selva pluvial, carretera al mar cerca de Villa Arteaga, *López & Sánchez 24* (US); Marinilla, *Kalbreyer 1303* (K). SANTANDER: region about La Paz, 25 km. NE. of Velez, moist pasture, Canta Ranas, 5 km. N. of La Paz, *Fassett 25177* (CAS, US). CHOCÓ: Bahía Utria, in forest along Río Sampechi, *Haught 5512* (NY, US); Río Nuquí, *Haught 5465* (K, US); Río El Valle cerca de la desembarcadura al Río Miniquía, entre este y el Río Mutatá, terreno pedregoso, lecho seco del río, *Forero & Gentry 736* (MO); carretera Tutunendo–El Carmen, entre kms. 135 y 120, Alto. R. Atrato, *Forero et al. 6162* (COL, MO, pf); 6 km.

W. of Siete on Medellín–Quibdó Road, 38 km. W. of Bolívar, *Gentry & Rentería 23712* (COL, MO, pf). CUNDINAMARCA: zwischen Guayabetal und Manzanares, Cordillera oriental, *Vogel 55* (US); Nocaima–Hacienda Tobia, *García-Barriga 10576* (US). TOLIMA: El Fresno, bosque abierto, *Cuatrecasas 9378* (F, US). META: Río Manzares Valley, 22 km. W. of Villavicencio, subtropical forest, *Grant 996* (US); along Río Guatiquía near Villavicencio, *Killip 34414* (US). VALLE: Río Bravo, NW.(?) of Darien, edge of thick woodland, *Robinson 125* (K, US); Río Digua valley, Chorrera La Elsa, densely forested valley, *Killip 34805* (US). CALDAS: Pueblo Rico, La Selva, *von Sneidern 5422* (s, pf). **Ecuador.** NAPO-PASTAZA: Cosanga [77°52'W., 0°35'S.], hillside W. of town, *Boeke & McElroy 379* (NY (unicate—topotype of *Hibiscus trichomathus*)); near Baeza [15 km. N. of Cosanga] on road to Tena, *Davis 366* (s); road Baeza–Tena, ca. 5 km. from Baeza; alt. 200 m., *Øllgaard & Balslev 10242* (AAU). PICHINCHA: road Aloag to Santo Domingo, Toáchi at confluence of Río Pilatón and Río Toáchi, *Sparre 15126* (s, pf). BOLÍVAR: below Balzapamba, *Haught 3314* (NY, s, UC, US). LOS RÍOS: Puembo, 34 km. E. de Quevedo, Río Quevedo, arroyo, *González & Gilmartin 11* (MO). ZAMORA-CHINCHIPE: Zamora, rain forest, *Harling 5932* (s, pf). **Bolivia:** Cochabamba, Chimore [64°53'W., 16°50'S.], km. 180, wet slopes at forest edge, *Cárdenas 2151* (US (2 sheets)).

*Wercklea ferox* is distinctive in having its flowers and fruits in fascicles of 1 to 5 (to 9) per axil, and in having glabrous fruits completely enclosed by inflated calyces and borne on relatively short pedicels. Its petals are the smallest of the yellow-flowered species.

*Wercklea ferox* always grows in wet habitats, frequently near rivers and at relatively low altitudes. It has often been collected near sea level, at or near the mouths of rivers; it also occurs in wet forests and forest margins up to 1000 (rarely 2000) meters altitude.

Collectors' notes variously characterize it as a "large herb," a "coarse herb," a shrub, or a small tree; sometimes it is described as having "succulent" stems. Herbarium specimens reveal that relatively young stems (which more commonly make their way into a plant press) often are either hollow or have soft pith; older stems are clearly woody.

In addition to noting the growth habit and prickly herbage, collectors also commonly record the striking color contrasts presented by plants of this species. Because these colors are generally poorly preserved in dried specimens, they deserve special comment. The corolla is usually said to be yellow (or bright or golden yellow), sometimes yellow with a reddish throat, sometimes orange. The calyx and involucrel are usually noted to be red or bright red. The young stems, the petioles, and the main veins of the lower surface of the leaves are also described as red or sometimes as pink. All in all, the plant seems to merit the description "very conspicuous" (*Haught 3314*). The flowers are said to be odorless (*Gentry 8801*).

That Cárdenas found this species in Bolivia draws attention to a significant hiatus in its distribution in Peru (MAP 1). Either the plant occurs in Peru but has escaped detection because it is found in poorly collected areas, or the hiatus is real and a disjunction exists; a third alternative is that the

Bolivian material represents a distinct taxon. My initial view, on first examining the Cárdenas specimens from Bolivia, was that they represent a distinct (undescribed) species. A fuller understanding of the variability found within *Wercklea ferox*, however, makes it clear that the Bolivian material cannot be distinguished from this species, at least on the basis of the material available. Unfortunately, fruiting specimens from Bolivia have not yet been collected.

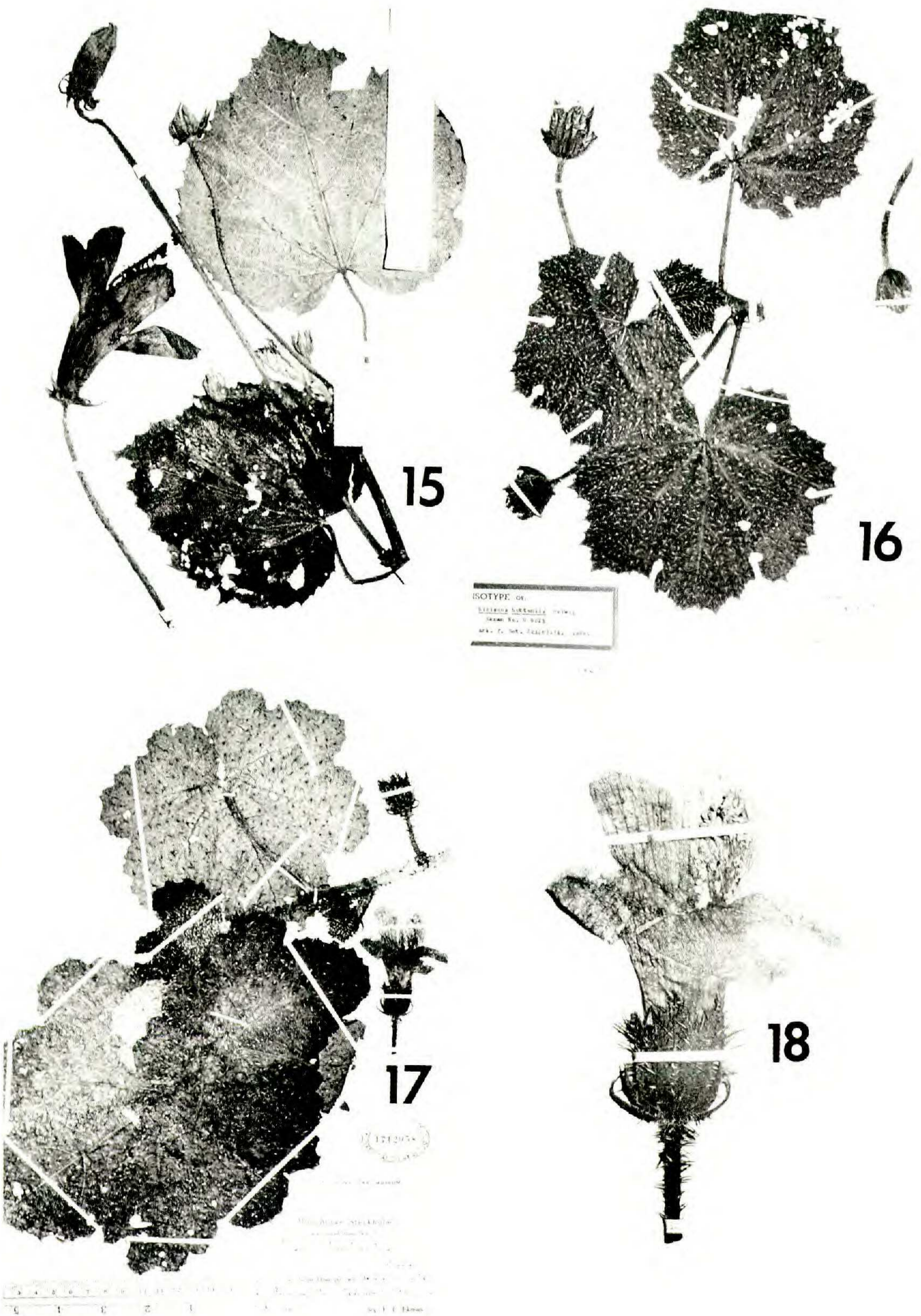
*Wercklea ferox* is both the most widely distributed and the most variable species of the genus. For example, the prickles that are so distinctive of the species are not always present. On the leaves, especially, they may vary from dense to absent (FIGURES 11, 13). There are usually at least some prickles present on the older stems, but these stems are only rarely represented in herbarium specimens. Even on the calyx and pedicel, where dense, spreading prickles are characteristic, these hairs are sometimes reduced to simple pungent hairs without swollen bases. Other structures (calyx, involucler, pedicels, stipules) are quite variable in size, but the overall pattern appears to be one of a single, highly variable species.

2. *Wercklea pseudoferox* (Hochr.) Fryxell, comb. nov.

FIGURE 15.

*Hibiscus pseudoferox* Hochr. *Annuaire Conserv. Jard. Bot. Genève* 4: 123. 1900. TYPE: NOV. Granada [Colombia], [Norte de Santander], Ocaña to Pamplona, Salazar, 5000–6000 [ft.] [1500–1800 m.], 26 Mar. 1879, *Kalbreyer 1037* (lectotype, κ; isotype, κ).

“Half-shrub 4–7 ft.” [1.2–2.1 m.] tall; stems stellate-pubescent and sparsely prickly, the prickles conical and retrorsely curved, 2–2.5 mm. long, 1.5 mm. in diameter at base. Leaf blades to at least 28 cm. long, 35 cm. broad, cordate, ovate, sharply serrate (teeth spinescent), acute, palmately 7-nerved, discolorous, the upper surface with appressed simple hairs and few 2- (or more-)armed stellate hairs, and with few spine-tipped prickles on lamina between veins, the lower surface densely stellate-pubescent and with few spine-tipped prickles on principal veins. Petioles  $\frac{1}{2}$ – $\frac{2}{3}$  length of blade, densely stellate-pubescent with few longer simple hairs and with occasional conical prickles to 3 mm. long. Stipules 8–12 mm. long, 3–6 mm. wide, lance-ovate, acute, stellate-pubescent externally, antrorsely strigose within. Pedicels solitary in leaf axils, exceeding subtending petiole, ca. 20 cm. long at anthesis to 34 cm. long in fruit, stellate-pubescent and with spine-tipped prickles 1–2 mm. long. Involucler 2–2.5 cm. long, of 8 or 9 bracts; bracts distinct, 4–6 mm. wide, lanceolate, acute, stellate-pubescent, with pungent hairs at very base. Calyx 6 cm. long at anthesis to 9 cm. long and inflated in fruit, ca.  $\frac{1}{3}$ -divided, prominently ribbed, densely stellate-pubescent throughout and with spine-tipped prickles especially on ribs of lower half; lobes 3-ribbed, triangular, acute, 10–12 mm. wide at sinus. Petals 10.5 cm. long, “brown-yellow,” stellate-pubescent externally. Staminal column 10.5 cm. long, glabrous, antheriferous in distal 3 cm.; filaments 3–5 mm. long. Style glabrous, exceeding staminal column by 7 mm., 5-parted for distal 2 mm.; stigmas capitate, 3 mm. in diameter, with long (1 mm.) hairs. Capsule included in calyx, 5.5 cm. long, essentially glabrous.



FIGURES 15-18: 15, *Wercklea pseudoferox* (Kalbreyer 1037); 16, *W. hottensis* (Ekman 9223); 17, 18, *W. horrida* (Ekman 14115).

DISTRIBUTION. Colombia (MAP 2); known only from the type locality.

*Wercklea pseudoferox* has its closest affinity to *W. ferox*, as the name suggests, but is characterized by inflated, spathaceous calyces enclosing the fruit, coupled with solitary, very long pedicels and a relatively small involucl.

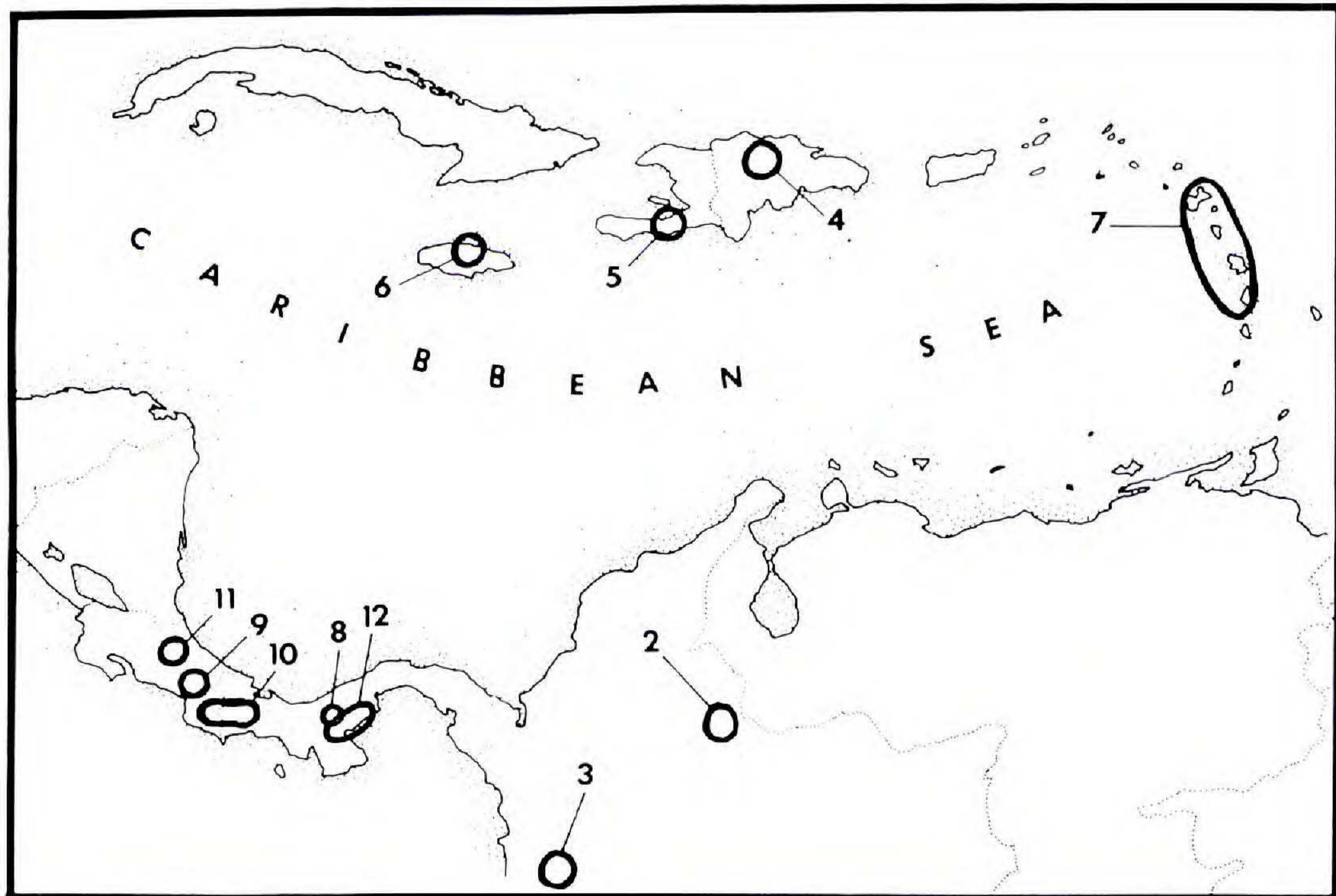
3. *Wercklea magnibracteata* Fryxell, sp. nov.

FIGURES 21, 22.

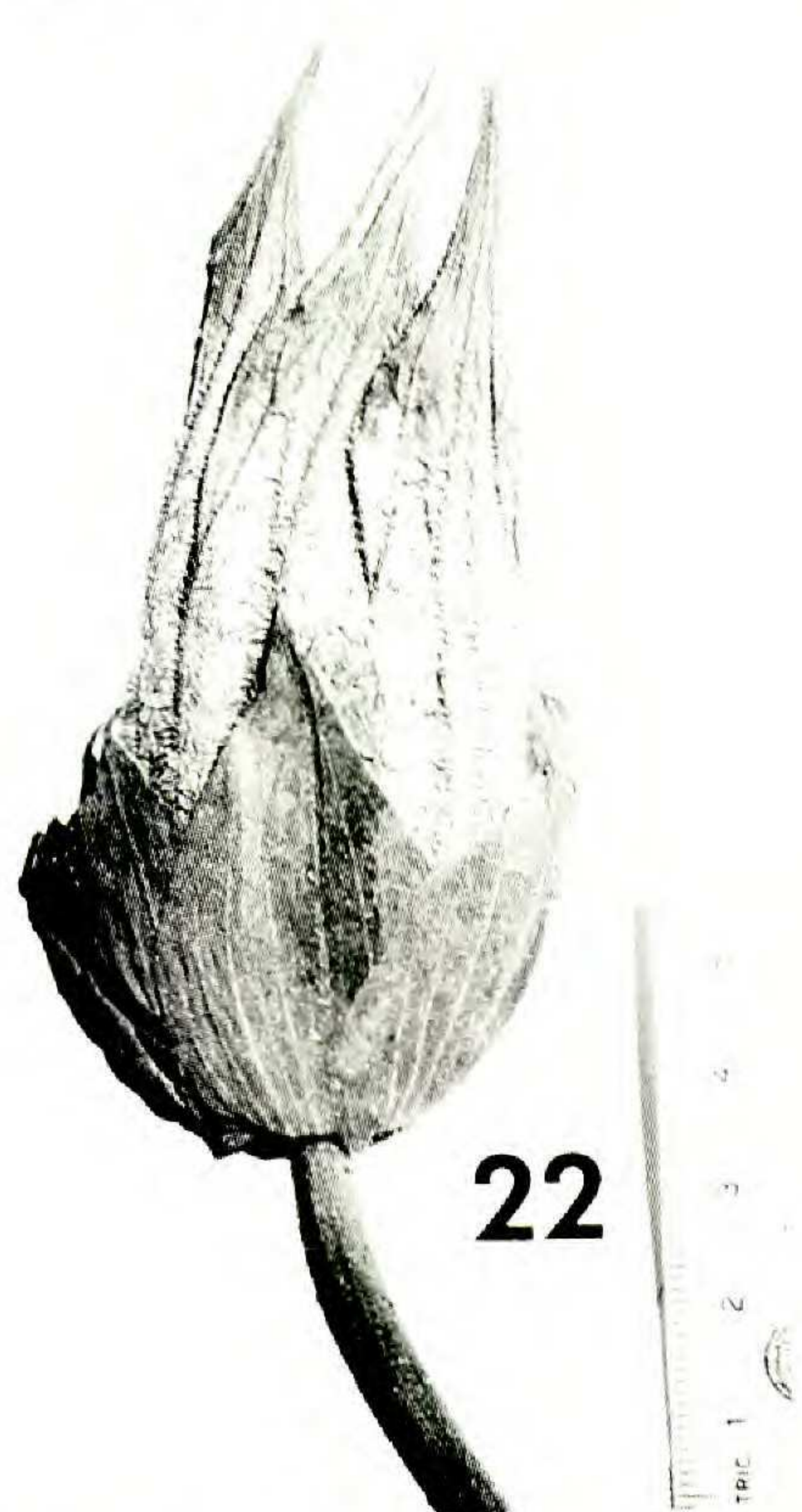
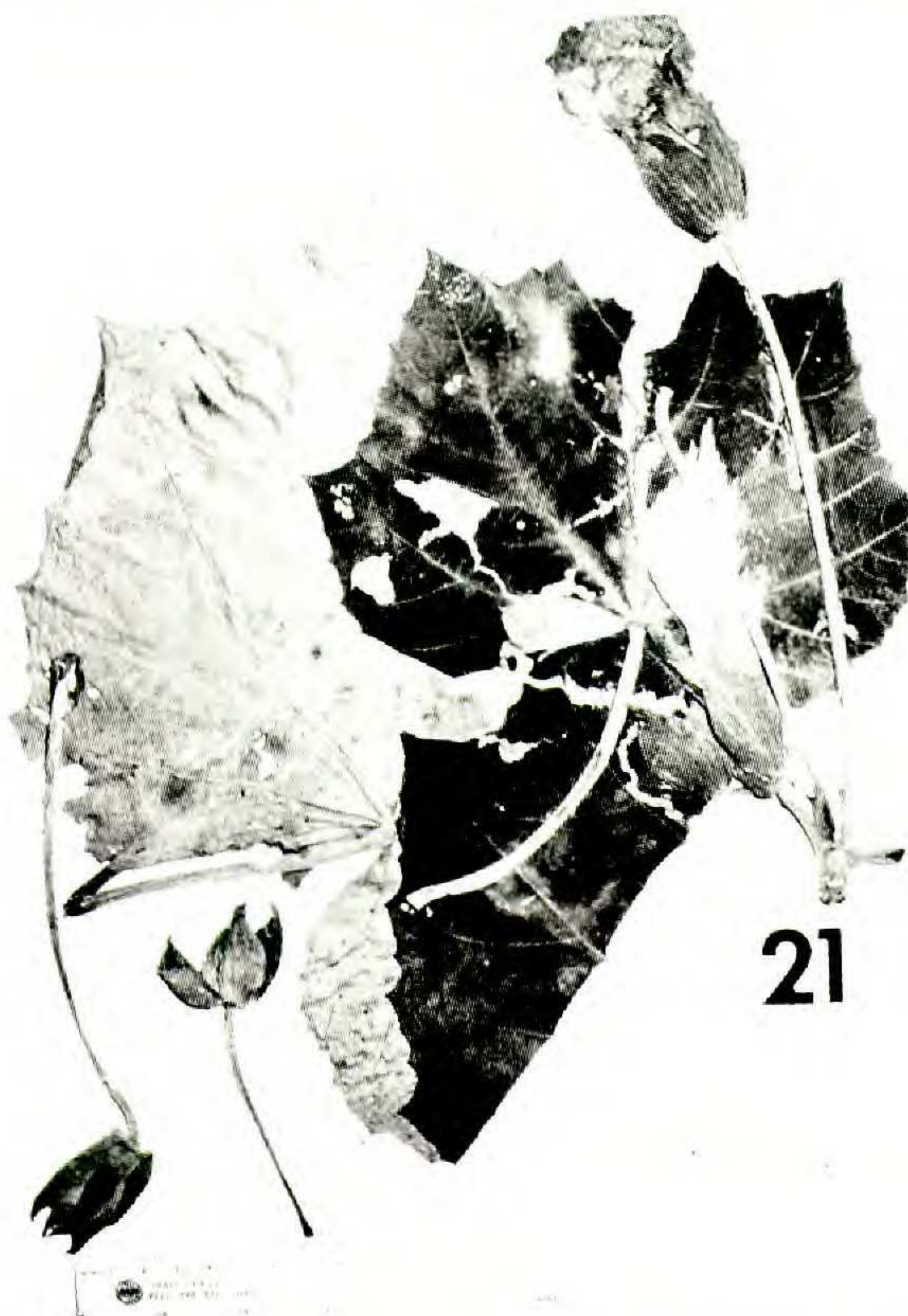
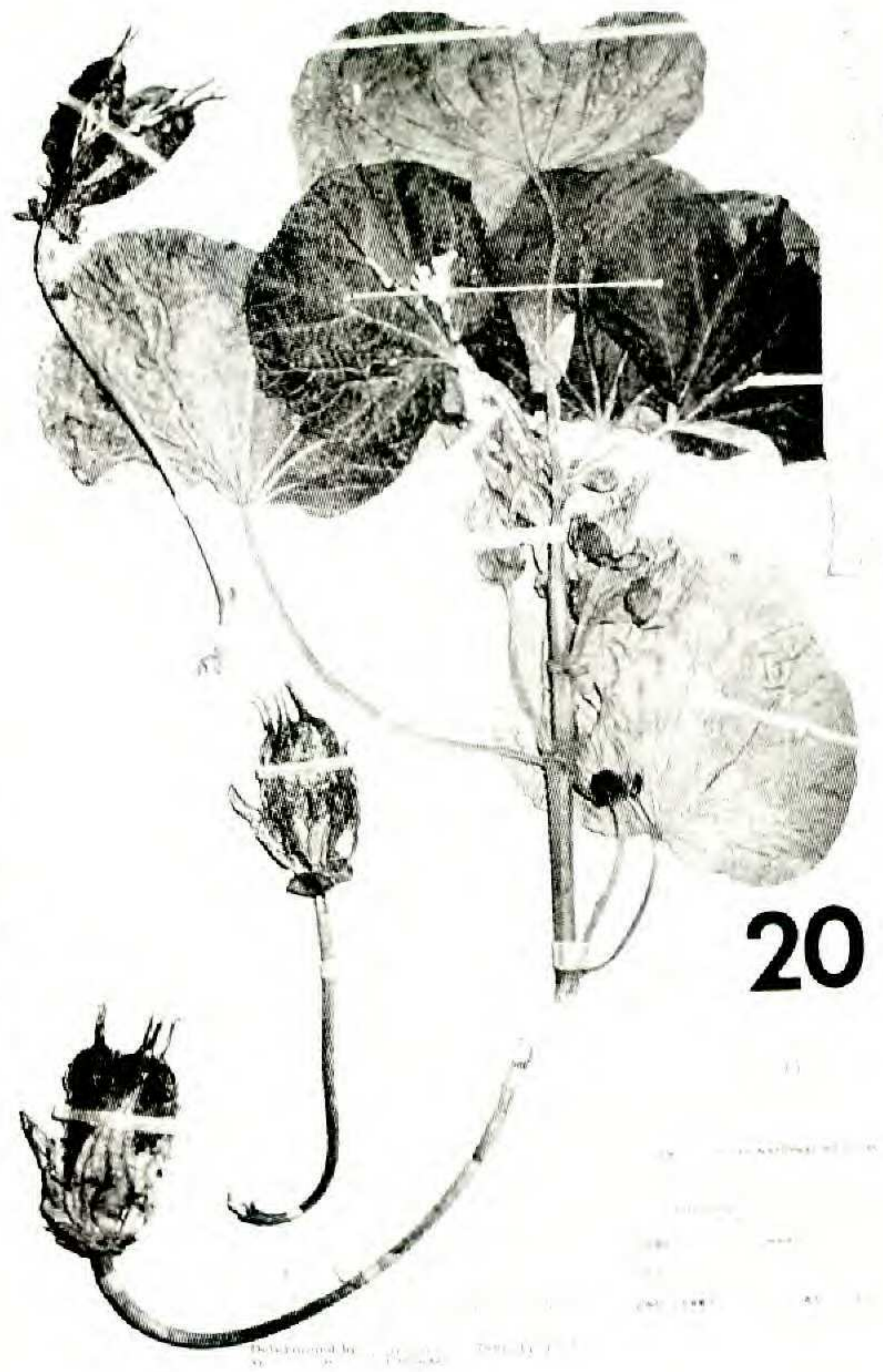
*Wercklea arborescens*, stellato-pubescentis; foliis plus latioribus quam longioribus, pentangularibus vel 5-lobulatis, lobulis acutis; stipulis ovatis, acutis, 40–52 mm. longis, 20–25 mm. latis; pedicellis florentibus ca. 19 cm. longis; bracteis involuclorum 3–6, distinctis, ovatis, 40–45 mm. longis, 16–27 mm. latis; calycibus 6–9.5 cm. longis, accrescentibus atque inflatis fructus includentibus; capsulis glabris.

TYPE: Colombia, Antioquía, 34 km. W. of Dabeiba on road to Mutatá, alt. 420 m., steep roadside cliff; weak tree 8 m., flowers yellow, all closed at mid-day, 8 Oct. 1977, *Gentry & León 20267* (holotype, MO; isotypes, COL, pf).

Tree to 8 meters tall; stems densely stellate-pubescent and with occasional prickles ca. 1 mm. long. Leaf blades to at least 24 cm. long, 28 cm. wide, cordate, weakly 5-angled or -lobulate, margin remotely serrate, lobes acute, palmately 9-nerved, the upper surface with scattered, minute, stellate hairs



MAP 2. Distribution of species of *Wercklea* (excluding *W. ferox*). Species numbered as in text: 2, *W. pseudoferox*; 3, *W. magnibracteata*; 4, *W. horrida*; 5, *W. hottensis*; 6, *W. flavovirens*; 7, *W. tulipiflora*; 8, *W. grandiflora*; 9, *W. lutea*; 10, *W. woodsonii*; 11, *W. insignis*; 12, *W. cocleana*.



FIGURES 19–22: 19, *Wercklea grandiflora* (Nee 9842); 20, *W. insignis* (Rowlee & Stork 286; see FIGURE 6); 21, 22, *W. magnibracteata* (Gentry & León 20267).



(these sometimes few armed and antrorsely oriented) and with veins more densely pubescent, the lower surface stellate-pubescent (densely so and yellowish when young). Petioles shorter than blades, with pubescence like that of stem. Stipules 40–52 mm. long, 20–25 mm. broad, ovate, acute to acuminate (rarely bifid), minutely stellate-pubescent externally, antrorsely strigose internally, parallel veined. Pedicels solitary or paired in leaf axils, ca. 19 cm. long at anthesis (equaling or exceeding subtending petiole?), stellate-pubescent and with pungent hairs 2 mm. long especially toward distal end. Involucel 40–45 mm. long, of 3 to 6 bracts; bracts distinct, lanceolate to ovate, acute, 16–27 mm. broad, minutely stellate-pubescent and with few pungent hairs on veins near base. Calyx 6 cm. long at anthesis to 9.5 cm. long and inflated in fruit, ca.  $\frac{1}{3}$ -divided, prominently ridged, densely hispid, especially on nerves, with pungent hairs 1–3 mm. long. Petals yellow, ca. 10 cm.(?) long, externally stellate-pubescent distally. Capsule ca. 4 cm. (or more?) long, glabrous, reticulate veined, weakly winged.

DISTRIBUTION. Colombia (MAP 2); known only from the type location.

*Wercklea magnibracteata* is most clearly allied to *W. pseudoferox*, as is indicated by its position in the key. It is allied generally with those species having glabrous capsules, and more specifically with those (*W. ferox* and *W. pseudoferox*) having accrescent, spathaceous calyces. However, it also shares certain characters (pubescence pattern, large stipules and involucel) with *W. grandiflora*, further indicating ties between the glabrous- and hispid-fruited species and supporting the integrity of *Wercklea* as here delimited. *Wercklea magnibracteata* is distinctive for its large, involucellar bracts (whence the specific epithet; see FIGURE 22), which are distinct and relatively few in number.

4. ***Wercklea horrida*** (Urban) Fryxell, comb. nov.                      FIGURES 9, 17, 18.

*Hibiscus horridus* Urban, Symb. Antill. 7: 280. 1912. TYPE: Sto. Domingo, Prov. Barahona, Gipfel des Noche Buena Berges, 1800 m., Sept. 1911, *Fuertes 1074* (lectotype, NY; isotype, A); *Fuertes 1128* (syntype).

Stout herb or tree 3–8 meters tall; stems stellate-pubescent and with relatively narrow conical prickles 3–7 mm. long. Leaf blades to at least 20 cm. long, 28 cm. wide, cordate, more or less orbicular, often 5- to 7-lobed, prominently dentate (teeth often spine tipped), acute or obtuse, palmately 7-nerved, the upper surface sparsely and minutely stellate-pubescent to glabrate and with narrow prickles 2–7 mm. long on lamina between veins, the lower surface stellate-pubescent and with narrow prickles 5–8 mm. long abundantly on principal and secondary veins, somewhat discolored. Petioles to 22 cm. long, stellate-pubescent and with narrow prickles 4–8 mm. long. Stipules not seen, scars 10–12 mm. long. Pedicels 1 or more in leaf axils, shorter than subtending petiole (up to 7 cm. long), with stellate pubescence and densely beset with narrow prickles 4–9 mm. long. Involucel 10–18 mm. long, ca. 10-parted; bracts lanceolate, acute, 1.5–3(–6) mm. wide, with fewer hairs and prickles than pedicel or calyx. Calyx 2–3.5 cm. long at anthesis, tubular,

ca.  $\frac{1}{4}$ -divided, stellate-pubescent and densely beset with narrow prickles 3–10 mm. long. Petals 6–9 cm. long, 1.5–2.3 cm. wide, “rose” or “red-brown,” stellate-pubescent internally and externally except toward base, reflexed making corolla salverform. Staminal column about equaling petals but appearing exerted when petals reflex, glabrous, staminiferous in distal  $\frac{1}{2}$ , filaments 2–6 mm. long. Stigmas slightly exerted from staminal column, capitate, hairy. Fruits 2–3 cm. long, ovoid, wingless, 5-loculed, glabrous and prominently reticulate veined externally, pubescent internally with hairs 2–3 mm. long. Seeds 2.8 mm. long, blackish, glabrous, reniform.

DISTRIBUTION. Dominican Republic (MAP 2), 1000–1800 m. alt.

ADDITIONAL SPECIMENS EXAMINED. **Dominican Republic.** Banks of Arroyo de la Sal, Loma de la Sal, Jarabacoa, *Bro. Alain Liogier 11399* (IJ, NY). BARAHONA: Montiada Nueva, forested hillslopes SE. of Polo, trail to Paraíso, S. of Montiada Nueva, *Howard & Howard 8543* (BM, GH, NY, S, US); between Monteada Nueva and Loma Alta, *Howard 12312* (A, BM, BR, US). LA VEGA: Cordillera Central, road Costanza to Zarabacoa at El Río, *Ekman H14115* (NY, S, US).

*Wercklea horrida* is distinctive for its very small (2–3 cm. long) fruits and is further characterized by its combination of glabrous fruits, rose-colored corolla, and calyx not enclosing the fruit. It is also notable for its conspicuously armed herbage, as its name suggests.

5. *Wercklea hottensis* (Helwig ex Urban) Fryxell, comb. nov.      FIGURE 16.

*Hibiscus hottensis* Helwig ex Urban, *Ark. Bot.* **22A**(8): 74. 1928. TYPE: Haiti, Massif de la Hotte, central group, St. Louis du Sud, Bonnett Carré, 900 m., quite common, 2 Nov. 1927, *Ekman 9223* (lectotype, S; isotypes, IJ, US).

Shrub 2–3 meters tall; stems with yellowish prickles 3–6 mm. long, otherwise glabrate; young stems with soft pith. Leaf blades to at least 18 cm. long, 23 cm. wide, cordate, more or less orbicular, obscurely 7-lobed, prominently dentate (teeth spine tipped), acute, palmately 7- to 9-nerved, the upper surface glabrate and with narrow prickles 1.5–5.5 mm. long on lamina between veins, the lower surface sparsely stellate-pubescent (especially on veins) and with narrow prickles 1.5–5.5 mm. long on principal and secondary veins, discolorous. Petioles to 15 cm. long, sparsely stellate-pubescent and with narrow prickles 4–6.5 mm. long. Stipules not seen, stipule scars 10–12 mm. long. Pedicels solitary in leaf axils, longer than subtending petiole, up to 20 cm. long at anthesis to 28 cm. long in fruit, glabrate proximally to densely and minutely stellate-pubescent distally and with narrow, yellowish prickles 2–4 mm. long. Involucel 18–25 mm. long, more or less gamophyllous, irregularly 6- to 10-lobed, sometimes splitting to base in 1 or 2 places, many veined from base, glabrate or stellate-pubescent and spinescent on veins. Calyx 3 cm. long at anthesis to 4.5 cm. long in fruit, prominently 15-nerved, ca.  $\frac{1}{4}$ -divided, stellate-pubescent and beset with narrow prickles 3–6 mm. long (principally on nerves). Petals “pale flesh colored” (yellowish when

dry), 6–8 cm. long, prominently parallel veined, minutely stellate-pubescent in distal  $\frac{1}{2}$ , glabrous in proximal  $\frac{1}{2}$ . Staminal column about equaling petals, staminiferous only near apex. Fruits 5 cm. long, oblong-ovoid, wingless, 5-loculed, glabrous externally, pubescent internally, the hairs 2–3 mm. long, delicate, whitish. Seeds 2.5 mm. long, blackish, glabrous, reniform.

DISTRIBUTION. Haiti (MAP 2), ca. 1000–1200 m. alt.

ADDITIONAL SPECIMEN EXAMINED. **Haiti.** DÉP. DU SUD: pr. Donyette (int. Port à Piment et Aut Anglais), *Ekman H482* (s).

*Wercklea hottensis* is characterized by its combination of rose-colored flowers, glabrous fruits (not enclosed by an inflated calyx), long pedicels, and more or less gamophyllous involucels.

6. *Wercklea flavovirens* Proctor, sp. nov.

FIGURES 7, 8.

*Wercklea arborescens*, sparse stellato-pubescent, spinescens juventute, postea inermis; foliis plus latioribus quam longioribus, 5-lobatis, remote serratis; stipulis ovatis, acutis, 20–45 mm. longis, 5–25 mm. latis; pedicellis usque ad 9.5 cm. longis; bracteis involucellorum ca. 6, ovatis, basaliter imbricatis, 25–30 mm. longis, usque ad 12 mm. latis; calycibus 25–30 mm. longis; petalis flavo-virentibus, 8–9 cm. longis, ca. 1.5 cm. latis; capsulis 4.5 cm. longis, extus glabris, intus hirsutis.

TYPE: Jamaica, Portland Parish, McRobert Patent, in John Crow Mtns., ca. 6 mi. [9.7 km.] by road S. of Sherwood Forest, secondary rain forest over limestone, ca. 1150 ft. [350 m.], 27 Mar. 1979, *Watts, Podzorski, & Kelly JCM1548* (holotype, U).

Spiny herb or unarmed tree, 5–6 meters tall; young stems densely covered with pungent, yellowish spines 5–11 mm. long, 0.5–1.5 mm. in diameter, underlying stellate pubescence sparse; mature stems unarmed, sparsely and minutely stellate-pubescent. Leaf blades to at least 28 cm. long, 35 cm. wide, palmately 5-lobed, basally cordate, remotely serrate (teeth spinescent in leaves of young plants), acute, palmately 7- to 9-nerved, minutely stellate-pubescent (especially on nerves) to glabrate above and beneath, in young plants also with yellowish, spine-tipped prickles 3–9 mm. long on lamina between veins above and on principal nerves beneath. Petioles to 15 cm. long, with pubescence like that of stem. Stipules 20–45 mm. long, 5–25 mm. wide, (lanceolate to) sessile-ovate, acute, minutely and sparsely pubescent (especially on margin), the hairs simple or stellate, deciduous leaving prominent scars. Pedicels solitary in leaf axils, to 9.5 cm. long, minutely stellate-pubescent. Involucel of ca. 6 bracts; bracts ovate, overlapping basally, 25–30 mm. long, up to 12 mm. broad, acute, minutely pubescent to glabrate, deciduous in fruit. Calyx 25–30 mm. long, minutely stellate-pubescent, ca.  $\frac{1}{2}$ -divided, lobes 3-nerved. Petals greenish yellow, 8–9 cm. long, ca. 1.5 cm. broad, externally with scattered, stellate pubescence except toward base, internally glabrous. Staminal column subequal to petals, glabrous, staminiferous in distal  $\frac{1}{2}$ ; filaments 3–4 mm. long. Style slightly exceeding androecium, barely divided, with 5 capitate,

pallid, hairy stigmas. Fruit an ovoid or fusiform capsule, 4.5 cm. long, 2.7 cm. in diameter, pentangular, acute or slightly beaked, externally glabrous and obscurely reticulate veined, internally densely hirsute, the hairs whitish, 3–5 mm. long. Seeds numerous, reniform, 3 mm. long, glabrous.

DISTRIBUTION. Jamaica (MAP 2); known from a single locality.

ADDITIONAL SPECIMENS EXAMINED. **Jamaica.** PORTLAND PARISH: in John Crow Mtns., ca. 6 mi. [9.7 km.] S. of Sherwood Forest, [juvenile specimen] *Proctor 36707* (U), [fruiting specimen] *Proctor 37837* (U).

*Wercklea flavovirens*, unusual in combining a juvenile form that is heavily spinescent with a mature form that is unarmed, is perhaps similar in this combination to *W. woodsonii* (“spined when young”—*Heithaus 411*). It has its affinity, both morphologically and geographically, with *W. horrida* and *W. hottensis*, from Hispaniola, as is indicated by its position in the key. The latter two species, however, are notably spinescent as mature plants. *Wercklea flavovirens* is further distinguished by its relatively narrow, greenish yellow petals (whence the specific epithet) and by its large fruits (exceeding the calyx) that are completely glabrous externally. Its leaves are more prominently lobed than those of most species of *Wercklea*, a characteristic that it shares with *W. horrida*.

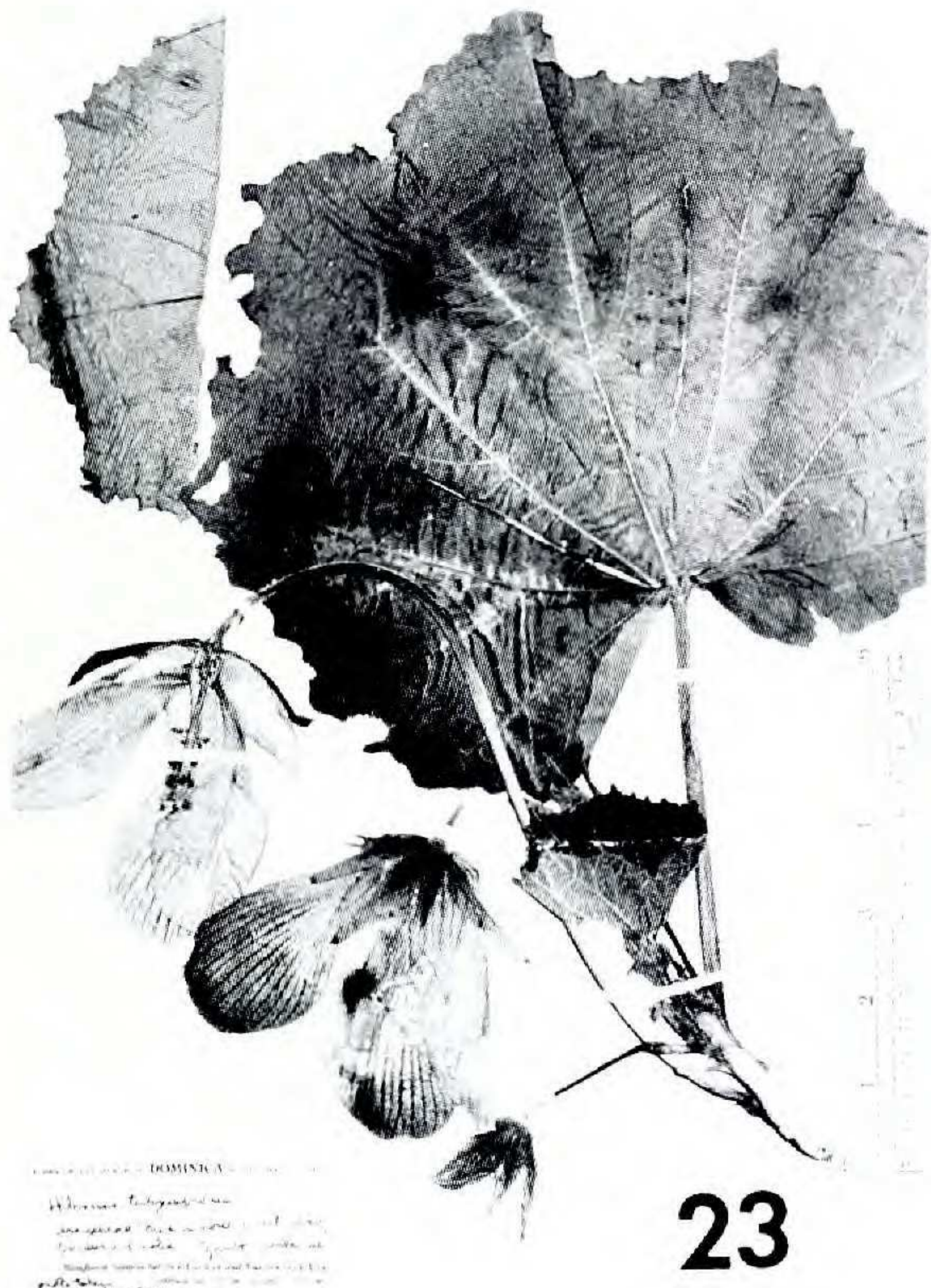
7. ***Wercklea tulipiflora*** (Hooker) Fryxell, comb. nov.      FIGURES 2, 23, 24.

*Hibiscus tulipaeiflorus* Hooker, Ic. Pl. II. 4: *tt.* 707, 708. 1845. TYPE: Isl. Dominica, Couliaban Mtns., *Imray 251* (κ (2 sheets)).

*Abelmoschus tulipaeiflorus* (Hooker) Walp. Rep. Bot. Syst. 5: 92. 1845.

*Hibiscus tulipiferus* Regel, Catal. Pl. Horto Arsakov. 71. 1860.(?)

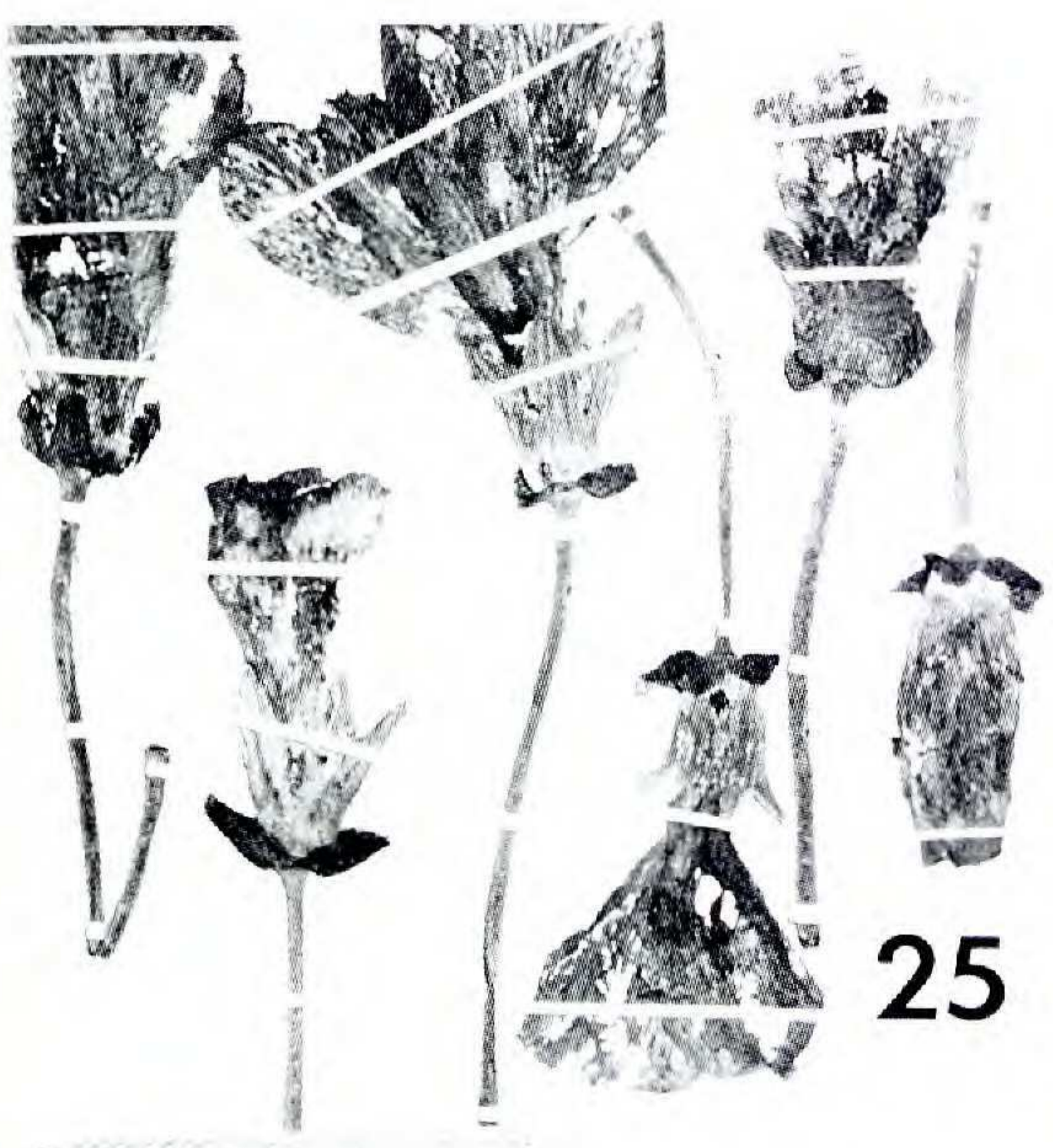
Tree 3–10 meters tall; stems minutely pubescent to glabrate. Leaf blades to at least 20 cm. long, 30 cm. broad, deeply cordate, indistinctly pentagonal or suborbicular, irregularly and coarsely crenate-dentate, obtuse or subacute, palmately 7- to 9-nerved, markedly discolorous, upper surface sparsely pubescent to glabrate, lower surface minutely and sparsely to densely stellate-pubescent. Petioles shorter than to longer than blades, very sparsely stellate-pubescent to glabrate. Stipules (1–)2–4 cm. long, 1–2.7 cm. wide, ovate to semicircular, acute to subacute, sometimes recurved, stellate-pubescent, deciduous. Pedicels 6–27 cm. long, stout (5–6 mm. in diameter) and woody in fruit, articulated 0.2–15 mm. above base, glabrate to stellate-pubescent, more densely so at apex. Involucel 2–5 cm. long, 6- or 7-parted; bracts distinct, spreading, 6–13 mm. wide (narrower at insertion), lanceolate to subrhomboid, acute, several nerved, sparsely stellate-pubescent. Calyx 3–5.5 cm. long, more than 1/2-divided, sparsely and very minutely stellate-pubescent; lobes 3- to 5-nerved, ovate, acute, 1.5–2 cm. broad at sinus, 2–3.5 cm. long. Petals 7–10 cm. long, ca. 3 cm. broad, pale yellow, externally stellate-pubescent throughout, sparsely pubescent internally. Staminal column 5.5–7 cm. long (somewhat shorter than petals), staminiferous nearly throughout length; filaments 1–4 mm. long (progressively shorter upward). Stigmas 5, capitate,



DOMINICA  
*Wercklea tulipiflora*  
 Hodge & Hodge 1879  
 No. 2323 (see FIGURE 2)  
 Standley 38339  
 H. Standley, 1914

23

24



25

26

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

FIGURES 23-26. 23, 24, *Wercklea tulipiflora*: 23, Hodge & Hodge 1879, in flower; 24, Duss 2323 (see FIGURE 2), in fruit. 25, 26, *W. lutea*: 25, Collado s.n., in flower; 26, Standley 38339, in fruit.

ca. 2 mm. in diameter, densely yellow-villous; style branches free for 1–2 mm., exceeding staminal column. Fruit a prominently winged capsule, usually stipitate and broadly obovoid, 4–5.5 cm. long, almost as broad, with beak 4–6 mm. long, densely stellate-pubescent and reticulate veined externally, internally pubescent on suture margin, the hairs mostly simple, 2–4 mm. long; fruits “turning black when ripe” (*Ramage s.n.*).

DISTRIBUTION. Lesser Antilles (MAP 2), 600–900 m. alt.

ADDITIONAL SPECIMENS EXAMINED. **Guadeloupe:** “gombo grand bois,” *Duss 2323* (NY, US); between St. Cloud and Bains Jaunes on trail to Soufrière, *Howard 11803* (A). **BASSE-TERRE:** Massif de la Soufrière, début du chemin menant vers le Pas du Roi, *Sastre, Fournet, & Clairon 2851* (A (2 sheets)), MO); trail to Morne la Soufrière, *Holdridge 427* (NY); chemin menant à la lère chute du Carbet, 2° pente, *Sastre & Sastre 2044* (A). **Dominica:** en monte Sulfureo, *Duchassaing s.n.* (K); Laudat, 19 April 1888, *Ramage s.n.* (K); vic. of Freshwater Lake, near Laudat, *Smith 10234* (IJ, NY, S); St. George Parish, Freshwater Lake, *Nicolson 1957* (DUKE); St. George, Freshwater Lake Area, S. face of Micotrin, mossy forest, *Wasshausen & Ayensu 311* (IJ, SMU); on slopes of Morne Macaque (Micotrin), *Wilbur et al. 8251* (DUKE); Freshwater Lake in elfin woodland, *Beard 235* (A, K, MO, NY, UC); between Freshwater Lake and Boeri Lake, *Wilbur et al. 8215* (DUKE, TEX); rainforest on precipitous slopes of Morne Colla Anglais, *Hodge 549* (NY), *Hodge 1127* (GH (2 sheets)); rainforest borders between Laudat and Freshwater Lake, *Hodge & Hodge 1879* (GH). Without exact locality, *Cooper 40* (DUKE, GH, NY). **Montserrat:** Chance’s Mtn., summit area, *Proctor 19109* (A, IJ); Chance’s Mtn., in elfin woodland, apparently confined to this summit, *Beard 447* (A, K, MO); forest at caldera ridge summit, Central Mtn. range, *Howard & Howard 17513* (A).

According to Stafleu (1967, pp. 215, 492), Hooker’s name was published in May, 1845, and Walpers’s name in November, 1845. Moreover, Walpers cited Hooker, indicating that the basionym was provided by Hooker and not by Walpers, as was stated by Kearney (1955, p. 283, note 29).

This species occurs in the Lesser Antilles in Guadeloupe, Dominica, St. Lucia, and Montserrat (cf. Stehlé, 1943), where it is evidently rare. It occurs at altitudes of 600–900 meters in wet forests or elfin woodlands.

Kearney (1955, p. 283, note 29), presumably following Hochreutiner (1900), cited *Hibiscus marmoratus* Lem. (Ill. Hort. 3: t. 82. 1856) as doubtfully synonymous with *H. tulipaeflorus*. The plate represents *H. lavateroides* Moric., however, not *Wercklea tulipiflora*. The plate in *Flore des Serres* (1856, t. 1159) is not identical, although it is clearly based on the same plant as the plate in *Illustration Horticole*. Kearney (*loc. cit.*) also cited a specimen from Santiago de las Vegas, Cuba (*Baker 102* (K, UC)) as a probably cultivated specimen of *W. tulipiflora*, but this specimen is, in fact, *H. indicus* (Burman f.) Hochr.

The corolla of *Wercklea tulipiflora*, according to Hooker’s original description, is rose colored, whereas Stehlé (1943) stated that the flowers were white. The labels of all the above-cited specimens that record flower color give it as yellow. It is likely that the fresh flowers are pale yellow and fade to rose, and that this pattern results in the discrepancy noted.

*Wercklea tulipiflora* is unique in the genus and is set apart from the other species by a series of characters, including stellate-pubescent fruits, complete absence of prickles or pungent hairs, deeply divided calyx, subrhomboid involucellar bracts, markedly discolored leaves, petals externally pubescent over the entire surface, and androecium stamiferous nearly throughout its length.

A collector's note (*Hodge 1127*) states "rope made of bark to tie bundles," another example of the use of bast fibers in the Malvaceae for this purpose.

8. *Wercklea grandiflora* Fryxell, sp. nov.

FIGURE 19.

*Wercklea arborescens*, stellato-pubescent; foliis plus latioribus quam longioribus, infra tomentosus, leniter pentangularibus, angulis subacutis; stipulis late rotundatis, obtusis vel acutis, 13–30 mm. longis, 12–21 mm. latis; pedicellis florentibus 13 cm. longis; involucellis 5 cm. longis, gamophyllis atque spathaceis, deciduis; calycibus 3.5–6.5 cm. longis, circa semi-divisis; petalis 13 cm. longis, plus minusve aurantiacis; columnis staminalibus 10–11 cm. longis, glabris; ovarii hispidis pilis urentibus 3–4 mm. longis.

TYPE: Panama, Veraguas, lower montane wet forest, 6–7 km. W. of Santa Fé on new road past agricultural school, alt. 2900 ft. [ca. 885 m.], tree 8 m. tall, 20 cm. d.b.h., area of older secondary growth, calyx turning red in fruit, petals orange at base, yellow-orange at tip, anthers yellow, stigmas velvety, deep red-purple, odorless, 17 Feb. 1974, *Nee 9842* (holotype, MO; isotypes, LL, US).

Tree to 8 meters tall; stems densely stellate-pubescent. Leaf blades to at least 20 cm. long, 24 cm. broad, cordate, weakly 5-angled or -lobulate, margin obscurely undulate-crenate, lobes subacute, palmately 9-nerved, upper surface with scattered stellate hairs, with radii tending to be antrorsely oriented and veins more densely pubescent, lower surface stellate-tomentose (densely so and whitish when young). Petioles shorter than blades, densely and uniformly stellate-pubescent like stem. Stipules 13–30 mm. long, 12–21 mm. broad, broadly rounded, obtuse to acute, densely stellate-pubescent, parallel veined. Pedicels at anthesis 13 cm. long, about equaling subtending petioles, with pubescence like that of stem. Involucel 5 cm. long, gamophyllous and spathaceous, minutely stellate-pubescent, irregularly toothed apically, deciduous. Calyx 3.5–6.5 cm. long, about 1/2- or less divided, minutely stellate-pubescent, "turning red in fruit"; lobes 3-nerved, 15–20 mm. long, 8–16 mm. broad at sinus, acute. Petals 13 cm. long, "orange at base, yellow-orange at tip," stellate-pubescent externally, glabrous internally. Staminal column 10–11 cm. long, glabrous, densely stamiferous in distal 2 cm.; filaments 3–5 mm. long. Style exceeding androecium and 5-parted apically; stigmas 5, purplish, capitate; ovary densely beset with antrorse, pungent hairs 3–4 mm. long. Fruits and seeds unknown.

DISTRIBUTION. Panama (MAP 2); known only from the type locality.

*Wercklea grandiflora* is distinctive for its long (5 cm.), spathaceous involucel

and perhaps for its more or less orange corolla. It shows certain similarities with *W. magnibracteata* (q.v.).

9. **Wercklea lutea** Rolfe, Kew Bull. **1921**: 118. 1921. TYPE: Costa Rica, San José, Las Nubes, on the slopes of Irazú, flowers clear lemon yellow, Feb. 1920, *Lankester s.n.* (holotype, K, photo MO; isotypes, K (2 sheets)). FIGURES 3, 25, 26.

*Hibiscus rolfeanus* A. Robyns, Ann. Missouri Bot. Gard. **52**: 177. 1965 (based on *Wercklea lutea* Rolfe). *Hibiscus luteus* (Rolfe) L. O. Williams & A. Robyns, Ann. Missouri Bot. Gard. **53**: 114. 1966.

Shrub or tree 3–10 meters tall; stems densely stellate-pubescent to glabrate, sometimes with scattered, conical prickles 3–5 mm. long. Leaf blades to at least 21 cm. long, 35 cm. wide, subcordate to cordate, orbicular to ovate, often weakly lobulate, prominently and remotely dentate to subentire, often acute, sometimes obtuse, palmately 7- to 9-nerved, discolorous, both surfaces sparsely and minutely stellate-pubescent, densely so on veins, rarely with few ligneous prickles on main veins beneath. Petioles  $\frac{1}{2}$ – $\frac{4}{5}$  length of blades, usually densely stellate-pubescent, rarely with few ligneous prickles. Stipules 8–22 mm. long, about as wide, broadly triangular-ovate to rotund, acute, stellate-pubescent, deciduous. Pedicels solitary in leaf axils, usually exceeding subtending petiole, 4–16 cm. long at anthesis to 21 cm. long in fruit, stout (5–6 mm. in diameter) and woody in fruit, sparsely to densely stellate-pubescent, more densely so at base of flower, sometimes with small (1–2 mm.), swollen-based, pungent hairs near base of flower. Involucel 2–3 cm. long, usually of 3 bracts; bracts more or less connate or splitting to base, ovate-sessile, 14–30 mm. wide, stellate-pubescent. Calyx 3.5–4.5(–5.5) cm. long,  $\frac{1}{2}$ - to  $\frac{1}{3}$ -divided, minutely stellate-pubescent, toward the base hispid and sometimes with swollen-based, pungent hairs 2 mm. long, the spinescent tips often bifurcate or stellate; lobes 3- to 5-nerved, triangular or ovate, acute, 12–22 mm. broad at sinus, minutely woolly internally especially along margin. Petals 8–13 cm. long, yellow, externally stellate-pubescent except toward base. Staminal column glabrous, staminiferous in distal 2 cm.; filaments 3–8 mm. long. Fruit a 5-angled or -winged capsule, 4–7 cm. long, obovoid, acuminate, beaked, externally densely hispid with hairs 2–3 mm. long, internally hispid along suture margin. Seeds 4 mm. long, reniform, blackish, with sparse, brownish, bristly hairs 1–2 mm. long.

DISTRIBUTION. Costa Rica (MAP 2), 1500–2500 m. alt.

ADDITIONAL SPECIMENS EXAMINED. **Costa Rica.** HEREDIA: Cerros de Zurqui, NE. of San Isidro, wet forest, *Standley & Valerio 50429* (US); 12 km. NE. of San Rafael, *Wilbur et al. 15951* (DUKE); Yerba Buena, NE. of San Isidro, wet forest, *Standley & Valerio 49705* (US); between Río Las Vueltas and Río Nuevo (10°6'N., 84°3'W.), *Burger & Baker 9442* (F); Río Vueltas (upper Río Patria), eastern slope of Volcán Barba near Continental Divide (10°6'N., 84°4'W.), *Burger & Liesner 6412* (DUKE, F, MO); Las Vueltas region N. of Cerro Chompipe, ca. 15 km. NE. of Heredia and 3 km. N. of Cerro Redondo de la Cruz, *Utley & Utley 1307* (F). CARTAGO: riverside woods just above



dam under construction by I.C.E. in Project Tapantí, *Lent 2196* (F, MO (3 sheets)). SAN JOSÉ: 3–5 km. NE. of Cascajal in vic. of Río Cascajal, *Wilbur 24419* (DUKE); Volcán Barba, *Elias de la Sota 5078* (CTES, pf); Las Nubes, wet forest, *Standley 38702* (US), *Standley 38645* (US), *Standley 38339* (US), *Collado s.n.* (US).

*Wercklea lutea* is described as locally common in wet evergreen forests and along streams. It sometimes has a few prickles on the stems and leaves and is thus intermediate between the very prickly species (e.g., *W. ferox*, *W. horrida*) and those completely lacking prickles (e.g., *W. tulipiflora*, *W. insignis*). Additionally, this species has been noted to have “mucilaginous sap” (*Burger & Liesner 6412*) and a floral odor that is “slightly sweet” (*Webster et al. 12383*).

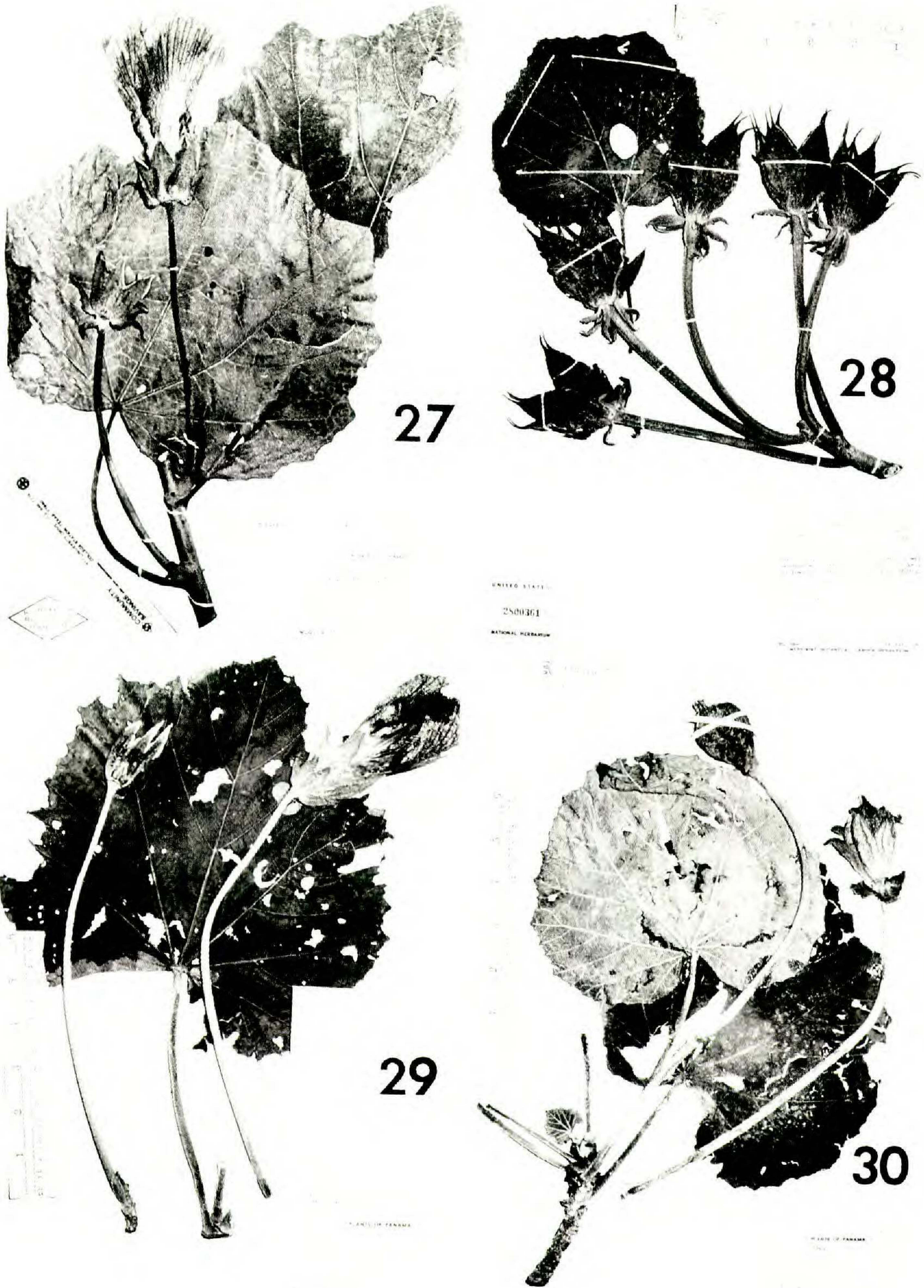
*Wercklea lutea* is characterized by its combination of yellow flowers, relatively long pedicels, and hispid fruits with prominent wings and beak. It differs from *W. woodsonii* specifically in the rounded form of the base of the involucl, as well as in the number and conformation of the individual divisions of the involucl. It may be unique in having often bifurcated or stellate pungent hairs at the base of the calyx.

10. *Wercklea woodsonii* (A. Robyns) Fryxell, comb. nov.

FIGURES 4, 5, 27, 28.

*Hibiscus woodsonii* A. Robyns, Ann. Missouri Bot. Gard. **52**: 179. fig. 1. 1965. TYPE: Panama, Chiriquí, vicinity of Bajo Chorro, alt. 1900 m., tree 20 m., fls. pale yellow, *Woodson & Schery 604* (holotype, US; isotype, MO).

Tree 4–20 meters tall; stems with minute, sparse to dense, stellate hairs, sometimes with “spiny trunk” (*D’Arcy & D’Arcy 6588*, *Lao 402*), or “spined when young” (*Heithaus 411*). Leaf blades to at least 24 cm. long, 30 cm. broad, cordate, indistinctly pentangular to suborbicular, remotely dentate to undulate, subacute to obtuse, palmately 7- to 9-nerved, discoloured, upper surface sparsely and minutely stellate-pubescent (densely so on veins), lower surface minutely stellate-pubescent. Petioles shorter than blades, 9–20 cm. long, with stellate pubescence like that of stem, more densely pubescent near juncture with blade. Stipules 12–30 mm. long, 10–20 mm. broad, triangular-ovate, acute, stellate-pubescent. Pedicels solitary or paired in leaf axils, at anthesis shorter than to somewhat longer than subtending petiole, 5–24 cm. long at anthesis to 16–31 cm. long and stout and woody in fruit (5–9 mm. in diameter), with pubescence like that of petioles (sparse proximally, dense distally). Involucl 1.5–3 cm. long, 8- or 9-parted, stellate-pubescent (densely so at base); bracts connate basally into cup with truncate base, lance-triangular to ovate-cordate, 4–12 mm. wide, margins more or less revolute basally, reflexed in fruit, persistent. Calyx 3–5 cm. long, 1/2- or less divided, densely and minutely stellate-pubescent throughout and with swollen-based pungent hairs 1–2 mm. long on tube; lobes prominently 3- to 5-nerved. Petals 8–13 cm. long, 5–6 cm. wide distally, yellow, stellate-pubescent externally except toward base. Fruit a prominently winged, woody capsule, fusiform



FIGURES 27-30. 27, 28, *Wercklea woodsonii*: 27, *D'Arcy & D'Arcy 6588*, in flower; 28, *Nee 9999* (see FIGURE 5), in fruit. 29, 30, *W. cocleana*: 29, *Dwyer 1918*, in flower; 30, *Gentry 5633*, in fruit.

to obovoid with gradually or abruptly acuminate beak, 5–7 cm. long including 1–1.5 cm. long beak, densely hispid externally with hairs 2–4 mm. long, sparsely pubescent internally on suture margin. Seeds 3.5 mm. long, reniform, blackish, sparsely pubescent with light brown, cottony to bristly hairs 1–2 mm. long.

DISTRIBUTION. Panama and Costa Rica (MAP 2), 1800–2700 m. alt.

ADDITIONAL SPECIMENS EXAMINED. **Panama.** CHIRIQUÍ: slopes of Cerro Punta, *Gentry 5860* (MO, US), *Lao 402* (MO); above Cerro Punta, frequent, *D'Arcy 5368* (MO); along road between Cerro Punta and Las Nubes, *Croat 26385* (MO, pf); slope of Cerro Respinga above town of Cerro Punta, frequent in thickets and forests, *D'Arcy & D'Arcy 6588* (F, LL, MO, NY); trail through Paseo de Respinga on way to Boquete, *Wilbur et al. 13184* (F); roadsides, pastures, and remnants of lower montane wet forests, Bajo Grande, 1–3 km. E. of town of Cerro Punta, *Nee 9999* (LL, MO, US); roadsides between Cerro Punta and Bajo Grande, *Croat & Porter 16008* (MO); disturbed cloud forest at Monte Rey, above Boquete, *Croat 15752* (MO); valley of Río Chiriquí Viejo, vic. of Monte Lirio, *White 41* (MO (3 sheets)); Río Chiriquí Viejo, near El Volcán, in open sunlight, wet habitat, *White 175* (F, MO). **Costa Rica.** SAN JOSÉ: ca. 25 km. N. of San Isidro de El General, along Interamerican Highway (9°29'N., 83°41'W.), in secondary scrub on steep slope, *Burger 8399* (DUKE, F, MO), *Williams et al. 28539* (BM, C, F); between La Georgiana and San Isidro, 2700 m. alt., *Stone 2040* (DUKE); 29 km. N. of San Isidro del General, *Wilbur 21113* (DUKE); Cerro de la Muerte, steep, wet, scrub-covered hillsides, ca. 3 mi. [4.8 km.] N. of Villa Mills, *Webster et al. 12383* (F, MO); Páramo, roadsides, steep slopes, *Heithaus 411* (MO); Cordillera de Talamanca, near La División, N. of San Isidro de El General, *Williams et al. 24383* (F); entre San Isidro del General y La División, *Jiménez 883* (F); ca. 10 mi. [16 km.] SE. of La Asunción, *Wilbur & Almeda 16965* (DUKE, F); entre Cerro de la Muerte y San Isidro del General, *Jiménez 277* (F), *Lems 5180* (F).

The flowers are described as “very fragrant” (*White 175*), and the calyces as “light green” (*White 175*), “slightly orange” (*D'Arcy & D'Arcy 6588*), or “reddish” (*D'Arcy 5368*).

*Wercklea woodsonii* is distinctive in the conformation of the involucre, which is characteristically truncate at the base, with the basal margins of the bracts more or less revolute. It may have a spinescent juvenile form (*Heithaus 411*), similar to that of *W. flavovirens*.

11. *Wercklea insignis* Pittier & Standley ex Standley, Contr. U. S. Natl. Herb. **18**: 112. 1916. TYPE: Costa Rica, San José, La Palma, *Wercklé s.n.* (holotype, US). FIGURES 6, 20.

*Hibiscus wercklei* A. Robyns, Ann. Missouri Bot. Gard. **52**: 178. 1965. Based on: *Wercklea insignis* Pittier & Standley ex Standley (non *Hibiscus insignis* Martius, 1876).

Tree 5–15 meters tall; older branches glabrate, with light tan bark. Leaf blades to at least 26 cm. long, 38 cm. wide, cordate, orbicular to flabelliform, obscurely dentate or subentire, obtuse or subacute, palmately 9- (to 13-)nerved,

upper surface sparsely stellate-pubescent to glabrate (remaining pubescent at juncture with petiole), lower surface sparsely stellate-pubescent. Petiole about equaling blades, sparsely stellate-pubescent to glabrate. Stipules 4–10 mm. long, 5–15 mm. broad, sessile, semicircular, obtuse or subacute, minutely and sparsely stellate-pubescent. Pedicels 1 to 3 in leaf axils, 1–10 cm. long at anthesis to 20 cm. long in fruit, sparsely stellate-pubescent to glabrate. Involucel 1.5–2.5 cm. long, gamophyllous, irregularly divided. Calyx 3–5(–6) cm. long, sometimes reddish, ca.  $\frac{1}{2}$ -divided, minutely and very sparsely pubescent externally, glabrous internally except bearded on margins of lobes; lobes 3- to 5-nerved. Petals 10–15 cm. long, 5–6.5 cm. broad distally, lavender, ciliate on margin of claw, sparsely stellate-pubescent externally, glabrous internally except for minute, dark-pigmented, peglike vestiture especially near base. Staminal column 3–4.5 cm. long, pallid, subglabrous but with some peglike structures present; filaments 0.5–1 mm. long. Style slightly exceeding staminal column, glabrous, 5-parted for distal 1 mm.; stigmas 5, capitate, densely hairy, ca. 2 mm. in diameter. Fruit a winged capsule, obovoid, prominently beaked, 4.5–7 cm. long including 6–12(–18) mm. beak, densely hispid externally with hairs 3(–4) mm. long, glabrous internally. Seeds 3 mm. long, reniform, brownish, prominently pubescent, the hairs 3 mm. long, red-brown, cottony to bristly, patent.

DISTRIBUTION. Costa Rica (MAP 2), 750–1700 m. alt.

ADDITIONAL SPECIMENS EXAMINED. **Costa Rica.** PUNTARENAS: Central de Montes de Oro, alt. 1200 m., “balsa-burío,” *Lankester & Jiménez 1348* (F). ALAJUELA: *Lent 1183* (F, U, NY); El Silencio, *Smith P2124* (UC); between San Lorenzo and Los Angeles de San Ramón (10°14'N., 84°32'W.), *Burger & Antonio 11210* (F); near La Laguna, 6–8 km. S. of Villa Quesada, cut-over forest area in barranca, *Molina et al. 17503* (BM, DUKE, EAP, F, MO); near Zarcero, *Smith A708* (F); rain forest in gully, ca. 8 mi. [12.9 km.] S. of Quesada, *Webster et al. 12212* (MO); 12 km. N. of Balsa de San Ramón, *Utley & Utley 3753* (DUKE, F); Río Cataratas about 26 km. NNW. of San Ramón, *Wilbur et al. 22104* (DUKE). HEREDIA: waterfall of La Paz, Varablanca de Sarapiquí, *Stork 4671* (UC), *Burger & Burger 8006* (F), *Williams 20317* (F), *Lems 5020* (DUKE, F); dry fill area 8.1 km. N. of Vara Blanca on Hwy. 9, *Luteyn 609* (DUKE, MO); ca. 4.5 mi. [7.2 km.] N. of Vara Blanca, *Wilbur & Stone 10466* (DUKE, F); vic. of Angel Falls, slopes of Volcán Poas, *Godfrey 67307* (FSU, MO); frente a la catarata de El Angel, Río La Paz, entre San Miguel y Vara Blanca de Sarapiquí, *Jiménez 968* (F, NY); Lajas de Zapote, Alfaro Ruiz, *Jiménez 1807* (F). SAN JOSÉ: La Hondura, *Standley 37590* (US (2 sheets)), *Valerio 753* (F); vic. San José, cultivada en un jardín Guadalupe, *Jiménez 19* (US), *idem*, 1916, *Jiménez s.n.* (US), *Standley 33339* (US), *Popenoe 1022* (US); Sr. Jiménez garden, *Rowlee & Stork 286* (US); suburb of San José, *Rowlee & Stork 968* (US); below La Palma, *Burger 3892* (F, NY); La Palma, *Rowlee & Stork 254* (US); forêts de La Palma, *Tonduz 12536* (K, US (2 sheets)); La Palma area, NE. of San Jerónimo (10°2'N., 84°0'W.), *Burger & Antonio 11077* (F), *Burger & Visconti 10223* (F). CARTAGO: along Río Atirro ca. 2 km. E. of La Esperanza (9°47'N., 83°38'W.); elev. 850 m., *Taylor 18005* (NY); ca. 15 km. S. of Tapantí (9°42'N., 83°47'W.), *Burger & Liesner 6820* (F). Pejivalle, Riverside, *Lankester 878* (US (2 sheets)). Cascajal, *Lankester 329* (K (5 sheets), US).

*Wercklea insignis* is distinctive for its relatively sparse pubescence, subentire leaf margins, very short androecium (less than half the length of the petals), relatively small stipules, relatively long capsular beak, and prominently pubescent seeds. According to St. John (1973, p. 232), it has been introduced into cultivation in Hawaii.

12. *Wercklea cocleana* (A. Robyns) Fryxell, comb. nov.      FIGURES 29, 30.

*Hibiscus cocleanus* A. Robyns, Ann. Missouri Bot. Gard. **52**: 176. 1965.

TYPE: Panama, Coclé, El Valle, shrub 25 ft. [7.6 m.] tall, fls. rose-red, 7 Dec. 1962, *Dwyer 1918* (holotype, MO-1802085; isotypes, BR, MO-1802086).

Tree 5–12 meters tall; twigs densely stellate-pubescent. Leaf blades to at least 20 cm. long, 24 cm. wide, cordate, orbicular, dentate, acute to obtuse, palmately 9- to 11-nerved, upper surface sparsely stellate-pubescent (densely so on nerves), lower surface densely stellate-pubescent. Petioles shorter than to longer than blades, densely to sparsely stellate-pubescent. Stipules not seen. Pedicels solitary in leaf axils, exceeding subtending petiole, 13–26 cm. long at anthesis to 30 cm. long in fruit, densely stellate-pubescent and sometimes also prickly. Involucel 1.5–3 cm. long, more or less gamophyllous, stellate-pubescent, deciduous, irregularly lobed, lobes triangular. Calyx 3–5.5 cm. long, ca.  $\frac{1}{2}$ -divided, minutely stellate-pubescent and hispid with pungent hairs 1–2 mm. long especially toward base; lobes 3- to 5-nerved, ovate, acute, 10–16 mm. broad at sinus. Petals 7.5–12 cm. long, rose-red, stellate-pubescent externally except toward base. Staminal column 8–10 cm. long, stellate-pubescent (nearly glabrous apically), densely staminiferous in distal 2.5 cm.; filaments 3–5 mm. long. Fruit a winged capsule, obovoid, beaked, 5–6.5 cm. long including 5–8 mm. long beak, ca. 4 cm. broad, densely hispid, hairs 2 mm. long. Seeds “hairy.”

DISTRIBUTION. Panama (MAP 2), 700–900 m. alt.

ADDITIONAL SPECIMENS EXAMINED. **Panama.** COCLÉ: La Mesa, *Gentry 5633* (F, MO); ca. 4 km. from El Valle near La Mesa, *Correa & Dressler 1001* (DUKE); near La Mesa, *Wilbur & Luteyn 11730* (DUKE); Valle de Antón, *Buitrago 42* (MO); between Cerro Pilón and El Valle de Antón, cloud forest, *Duke & Dwyer 13934* (GH, K, MO, UC, US (2 sheets)).

*Wercklea cocleana* is characterized by its combination of rose- or lavender-colored flowers, pubescent staminal column, very long pedicels, and prominently winged and beaked capsules.

#### ACKNOWLEDGMENTS

I am grateful to David M. Bates for permission to cite unpublished cytological observations on *Wercklea ferox*, and to George R. Proctor for sharing information on his recent discovery of *W. flavovirens* in Jamaica and for authorizing its publication as a part of this study. Thanks are also due to the curators of the several herbaria cited herein, who generously made specimens in their care available for study.

## LITERATURE CITED

- BAILEY HORTORIUM STAFF. 1976. Hortus third. xiv + 1290 pp. Macmillan Publ. Co., New York. [*Wercklea*, p. 1171.]
- FRIES, R. E. 1947. Zur Kenntnis der süd- und zentralamerikanischen Malvaceenflora. Kongl. Svenska Vetenskapsakad. Handl. III. **24**(2): 1-37. pls. 1-9.
- FRYXELL, P. A. 1969. The genus *Hampea* (Malvaceae). *Brittonia* **21**: 359-396.
- HOCHREUTINER, B. P. G. 1900. Revision du genre *Hibiscus*. *Annuaire Conserv. Jard. Bot. Genève* **4**: 23-191.
- HUTCHINSON, J. 1967. *Wercklea*. P. 543 in: The genera of flowering plants. Vol. 2. Clarendon Press, Oxford.
- KEARNEY, T. H. 1951. The American genera of Malvaceae. *Amer. Midl. Natur.* **46**: 93-131. [*Wercklea*, p. 109.]
- . 1955. A tentative key to the North American species of *Hibiscus* L. *Leaflet W. Bot.* **7**: 274-284.
- PAYNE, W. W. 1978. A glossary of plant hair terminology. *Brittonia* **30**: 239-255.
- ROBYNS, A. 1965. New or critical Malvaceae from Central America. *Ann. Missouri Bot. Gard.* **52**: 176-181.
- . 1966. Flora of Panama, Malvaceae. *Ibid.* 497-578.
- ST. JOHN, H. 1973. List and summary of the flowering plants in the Hawaiian Islands. *Pacific Trop. Bot. Gard. Mem.* **1**.
- STAFLEU, F. A. 1967. Taxonomic literature. *Regnum Veg.* **52**: v-xx, 1-556.
- STANDLEY, P. C. 1916. Studies of tropical American phanerogams—no. 2. *Contr. U. S. Natl. Herb.* **18**: 87-142. [*Wercklea*, pp. 111, 112.]
- . 1937. Flora of Costa Rica, Malvaceae. *Field Mus. Natur. Hist., Bot. Ser.* **18**: 664-678. [*Wercklea*, p. 677.]
- STEHLÉ, H. 1943. Les Malvacées des Antilles françaises. *Boissiera* **7**: 27-45.
- WEBBER, I. E. 1934. Systematic anatomy of the woods of the Malvaceae. *Trop. Woods* **38**: 15-36.

U. S. DEPARTMENT OF AGRICULTURE  
SCIENCE AND EDUCATION ADMINISTRATION  
AGRICULTURAL RESEARCH  
and  
DEPARTMENT OF SOIL AND CROP SCIENCES  
TEXAS A&M UNIVERSITY  
COLLEGE STATION, TEXAS 77843